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ABSTRACT

The following are among the 52 papers included: "A Vision of Vocational Education and Training for the Approaching Millennium" (Mndebele); "Challenges for the 21st Century for Technical-Vocational Education and Training from Global, Regional and National Perspectives" (Basu); "A Customer-Oriented Approach for Curriculum Development in Vocational Education" (Chao); "Banking Education and Training in Hong Kong" (Ho); "Environmental Education for Sustainability" (Parkin, Lawrence); "Global Trends in the Workplace" (Farmer); "Intersectoral Approach to Literacy and VET (Vocational Education and Training)" (Washi); "New Designs for the Two-Year Institution of Higher Education" (Copa, Ammentorp, Jilk); "Restructuring Vocational Education and Training in Swaziland" (Mndebele); "Student Learning in Vocational Education" (Liljefelt); "Students' Motives for Making Study Choices with Increased Freedom in Constructing Their Study Programs" (Makinen, Vuorinen); "The Challenge for Vocational Education and Training in Hong Kong as Part of the 'One Country Two Systems' Philosophy" (Boardman); "The Challenges of the 21st Century for Vocational-Technical Education in Taiwan, Republic of China" (Wu); "Expert Learners Workshops Project" (Corrigan, Lee); "Link between Education and Training and Economic Growth" (Ashton, Sung, James); "Vocational Education and Training Projects in

Developing Countries" (Herschbach); "Vocational Course/Program Evaluation" (Campbell); "Finding New Strategies for Post-16 Education to Promote Parity of Esteem between Vocational and General/Academic Education by Networking in Seven European Countries" (Lasonen); "Bildung through Vocational Education" (Volanen); "Joint Venture Partnerships between Vocational Education and Training, and Businesses" (Campbell); "Job Performance Aids" (Campbell); "The Challenge of Functional Foreign-Language Literacy" (Johnson); "Adult Learning in the Vocational Education Context"(Bellis); "Shaping the Work Life"(Heidegger); "Do Joint European Vocational Training Standards Stand a Chance?" (Sellin); "Implementation of National Standards for the International Labor Market" (Hull, Matthews); "International Networks as Resources for Vocational Education and Training" (Dunham); "Network-Based Flexible Learning" (Majumdar, Das); "The Need for Strategic Alliances-Networks in VET" (Hollanders); "A Comparison of Occupational Programs in the Comprehensive High Schools among the U.S.A., Japan and Taiwan" (Lee); "Identification and Utilization of Education Trends for Cooperative Education Enhancement" (Leventhal); and "Nursing Student Information Network" (Saranto). (MN)

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Organizer:
The Union of Vocational Principal Associations in Finland

IVETA `97 CONFERENCE PROCEEDINGS

The Challenges of the 21st Century for Vocational Education and Training

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Editor:
Johanna Lasonen

International Conference on Vocational Education and Training
August 24.–28.1997
Helsinki, Finland

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Organizer:
The Union of Vocational Principal Associations in Finland

IVETA `97
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Editor:
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International Conference on Vocational Education and Training
August 24.–28.1997
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PREFACE

The **International Vocational Education and Training Association** (IVETA) holds every year two conferences that attract researchers, teachers, administrators and decision-makers involved in vocational education. IVETA's second yearly conference is organized in early or late summer in different parts of the globe. The IVETA '97 Conference takes place on August 24-28, 1997 in Helsinki, Finland. The other yearly IVETA conference convenes in the USA in connection with the Annual Convention of the American Vocational Association in December. **IVETA is an independent non-political and professional organisation of vocational educators and trainers.** It is dedicated to the advancement and empowerment of high-quality vocational education and training.

The IVETA '97 Conference has been organized by the Union of Vocational Principal Associations in Finland. Vocational education and training is an integral part of the Finnish educational system. About a half of the Finnish young people acquires secondary- or tertiary-level vocational education. The Union of Vocational Principal Associations in Finland represents all sectors and levels of Finnish vocational education and training. The Union consists of 460 members from eight principals' associations representing different sectors of vocational education. The purposes and modes of action of the Union of Vocational Principal Association in Finland involve:

- serving as a link between principals and directors of vocational education establishments, vocational adult education centres, polytechnics and colleges;
- enhancing principals' and director's professional development;
- promoting issues linked with their work; and
- promoting principals' and directors' international cooperation and serving as a national organ of international organizations in the field.

To accomplish its purpose the association arranges training and organizes negotiations, suggests policy actions and measures, comments on policies and measures in its field and maintains relationships with central and local authorities, teachers' labour market organizations and other educational and labour market associations in Finland and elsewhere. The **Executive Board of the Union of Vocational Principal Association** in Finland comprises the following persons: **Chair Dr. Pentti Rauhala**, President of Espoo-Vantaa Polytechnic; **Vice-Chair Ms. Leila Lahti**, contact person for EFVET (European Forum of Vocational and Technical Education and Training), Principal of Helsinki IV College for Health Care Professionals at Helsinki Polytechnic; and Principals Mr. **Markku Jokela**, Mr. **Markku Kantonen**, Mr. **Kimmo Tolkki**, Ms. **Tuulikki Kosonen**, Ms. **Leena Peltosaari**, Mr. **Jorma Työppönen** and Mr. **Antti Sipilä**.

The budget of the IVETA '97 Conference is some FIM 1.1 millions (220.000 USD). Registration fees cover about a third of the total costs. We wish to thank the Finnish National Board of Education for their financial support. Organizing the conference has also required many people's voluntary work contribution. We appreciate very much all help that we have received during the shared work to put the conference together.

Members of **the IVETA '97 Conference Organizing and Programme Committees** have given unstintingly of their time and saved no trouble to ensure the participants a well-organized and enjoyable conference. The IVETA '97 Programme Committee consists of the following members in Finland: IVETA '97 Programme Chair Dr. Pentti Rauhala, President of Espoo-Vantaa Polytechnic; Executive Director of the IVETA '97 Conference Ms. Leila Lahti, Principal of Helsinki IV College for Health Care Professionals at Helsinki Polytechnic; IVETA '97 Programme Co-Chair Dr. Johannna Lasonen, Project Manager from the Institute for Educational Research at the University of Jyväskylä; IVETA '97 Conference Secretary Ms. Kristiina Ilmanen, Informatician from Helsinki Polytechnic; Members of the Programme Committee: Ms. Taru Ohtola, Mr. Markku Kantonen, Ms. Leena Peltosaari, Ms. Tuija Kirveskari, Dr. Timo Luopajärvi, Ms. Annikki Mikkonen and Ms. Tuula Lampinen.

We highly appreciate Ms. Taru Ohtola's and Ms. Kristiina Ilmanen's persistent work for the IVETA '97 Conference. Taru Ohtola, Director of the Finnish dentists' professional society, supervised the conference. We also thank Mr. Arto Tenhunen, Press Officer and President of Soprano Communications Ltd, who has been responsible for disseminating information about the conference among the media. We also thank Ms. Tuija Kirveskari, National Board of Education.

The contribution of the IVETA Executive Board to the conference is highly appreciated. The members of the IVETA executive officers are: **President Jean Decker Mathews**, ILO Washington Office, USA; **President Elect Johanna Lasonen**, University of Jyväskylä, Finland; **President Emeritus Stuart Niven**, Scotland; **General Secretary Jeanette R. Daines**, Minnesota State Colleges and Universities, USA; **Executive Director Daniel B. Dunham**, Oregon State University, USA; **Vice President for Asia C.K. Basu**, Colombo Plan Staff College, Philippines; **Vice President for**

Central America/the Caribbean Joyce W. McKenzie, National Training Agency, Jamaica; **Vice President for East and Southern Africa Philip C. Loots**, East London Technical College, South Africa; **Vice President for Europe Hans-Günter Schröter**, German Agency for Technical Cooperation, GTZ; **Vice President for North America Amy Coughenour**, Center for Occupational Research and Development, Texas, USA; **Vice President for South East Asia/Pacific Dar-Chin Rau**, National Taiwan Normal University, Taiwan, R.O.C. The collaboration between the Union of Vocational Principal Associations in Finland and the International Vocational Education and Training Association in organizing and conducting the IVETA '97 Conference is a case of productive international networking for the promotion of high-quality vocational education and training.

Dr. Johanna Lasonen, President-Elect of IVETA, from the Institute for Educational Research at the University of Jyväskylä was responsible for organizing the programme of the IVETA '97 Conference and for editing the IVETA '97 Conference Proceedings. Thanks are due to the publication staff of the Institute for Educational Research, especially Marja-Liisa Mustonen, Kirsi Häkämies, Hannu Hiilos, Kaija Mannström and Jouni Sojakka. Director Jouni Välijärvi kindly accepted the IVETA '97 Proceedings for publication under the auspices of the Institute for Educational Research. The IVETA '97 Proceedings was published on non-commercial and non-profit bases.

The Organizing Committee of the IVETA '97 Conference acknowledges the contribution of the speakers and authors - altogether 56 speakers from 23 different countries, who have made up the programme of the conference and the contents of the present publication. We also thank the audience for their participation.

Pentti Rauhala
Leila Lahti
Johanna Lasonen June 1997

INTRODUCTION

The purpose of this publication is to serve as a forum for sharing vocational education and training problems and solutions worldwide on the five themes of the IVETA '97 Conference, listed below:

- The Challenges of the 21st Century for Vocational Education and Training from Global, National and Regional Perspectives
- Interrelationships between the Role and Responsibilities of Working Life and Vocational Education and Training
- Opportunities to Enrich Vocational Education and Skills Training through Applications of the Philosophy and Methods of Adult Education
- Implementing National Standards and Qualifications: Implications for the International Labour Market
- International Networks as Resources for Vocational Education and Training

Publishing the proceedings will also facilitate the dissemination of the results of the research and development projects that the members of IVETA have conducted. Another aim is creating opportunities for establishing professional linkages among international vocational educators and trainers.

The papers presented at the conference make up an interesting and high-class programme and publication. The speakers come from Philippines, Switzerland, Swaziland, the United States, England, Sudan, China (Hong Kong), Finland, Sweden, Taiwan, Austria, Norway, France, Scotland, Greece, Australia, Germany, South Africa, Korea, the Netherlands, Canada, India and Turkey. In their papers this impressive multidisciplinary assembly of scholars and experts discusses vocational education from an uniquely broad range of perspectives.

The programme consists of keynote sessions that are common to all delegates and paper sessions. The paper sessions and the two symposia comprise five parallel and simultaneous periods which present a range of topics for the delegates to choose from. In the conference programme the paper sessions have been grouped under subthemes so as to make it easier for the audience to select the sessions that interest them and provide more information on the presentations (see the IVETA '97 Conference Programme, pages 449-466).

The papers presented on the first day of the conference and collected in the first part of Proceedings deal with the prospects of the 21st century for vocational education and training from global, national and regional perspectives. The papers that address the two themes of the second day of the conference have been collected in the second and third part of the present publication. They discuss interrelationships between the role and responsibilities of working life and vocational education and training and take a look at opportunities to enrich vocational education and skills training through applications of the philosophy and methods of adult education. The fourth and fifth part of the Proceedings contain papers that considered the implementation of national standards and qualifications and analysed networks as resources for vocational education and training.

The expert contributors to the conference convey unmatched information about the issues currently important and the debates going on in each continent. Papers by African contributors reveal what aspects and dimensions of Human Resource Development (HRD) and vocational education are just now topical on their continent. The scholars from East Asia, the Pacific region and Australia examine labour market and HRD issues and curriculum development from a broad range of perspectives. The Northern American papers concentrate on current issues in studies of vocational education and on reflecting on the nature and prospects of vocational education research as such (Canada) as well as on such globally important questions as the preconditions of successful developmental projects. The European speakers' presentations cover the whole range of relevant topics from educational strategies to the epistemology of learning and contextual learning.

The papers also discuss subjects important across regional boundaries. From among 56 papers stand out such themes perceived as important by a number of people and regions as environmental sustainability, occupational higher education, teachers' and trainers' professional development, partnership between education and business, the integration of vocational and general education, comparisons of competences, evaluation and international networks as a mutual learning resource.

This is the first time when an IVETA conference is held in Europe. Europe has undergone profound social changes in the 1990s. Economic and social changes are felt in vocational education and training, and accordingly the vocational education systems of most European countries are being reformed. The European Union has undertaken the formulation of a sharper definition of vocational education and training by means of both educational policy statements (White Paper on Education and Training) and action programmes supporting their principles (e.g. the Leonardo da Vinci Training Programme on Vocational Education). The purpose of these endeavours is not to unify European educational systems but to enrich them through mutual cooperation and familiarity.

In many European countries vocational education has been closely linked with national occupational divisions. Because of international competition, European cooperation and the movement of the labour force across national boundaries, European countries must now learn to understand each others' vocational education and training systems. By comparing similarities and differences it is possible to gradually achieve shared concepts.

PART I

THE CHALLENGES OF THE 21 ST CENTURY FOR VOCATIONAL EDUCATION AND TRAINING FROM GLOBAL, NATIONAL AND REGIONAL PERSPECTIVES

A Vision of Vocational Education and Training for the Approaching Millennium

Comfort B.S. Mndebele

*Vocational and Agricultural Education, University of Swaziland
Swaziland, Southern Africa*

Introduction

Much of the contemporary model and rationale for the delivery of vocational education and training, developed at the turn of the current century, needs to be critically reexamined as we shape our vision as an Association for the rest of this decade and the next century. Vocational education and training for the approaching new millennium will be vastly different from that of the past. As the Association moves into the new millennium, it is imperative that contemporary issues and trends be characterized and analyzed with respect to their implications for the development of new paradigms and the improvement of the delivery of vocational education and training. As the world changes, we must understand and, indeed, keep pace with the changes; we must look to the future and to what developments we can reasonably anticipate in vocational education and training as we enter the new millennium. We need to develop a vision for a vocational education and training framework that looks inward and responds to the many and diverse external needs of our local, national and international needs of those it serves, while at the same time keeping a clear perspective on the changing world, in particular the world of work. Such a vision should be cognizance of the fact that we must prepare the workforce to face the challenges of a global economy. Vocational education and training is uniquely positioned to prepare a high quality, skilled work force as a prerequisite to global economic growth. But we need a vision for a vocational education and training framework that takes a global perspective for the global market place. That is the assignment, if you wish homework, for the International Vocational Education and Training Association (IVETA).

Because of the changes in the social and economic forces influencing the nature of work, labour market characteristics have also changed. The changing economic and technical realities alter the institutional structures themselves. The new structures, in turn, change basic skill requirements. Employees of the new institutions need significantly higher basic and technical skills. These are skills that enhance group effectiveness such as team work, negotiation and organizational skills. To be effective in their organization, employees must understand how their personal goals and objectives fit into the organization's culture and its strategic goals. With such understanding, employees can influence the organization to develop their skills in a mutually productive way.

In this presentation, I will endeavour to reflect on selected issues and problems in vocational education and training, and subsequently challenge the Association to consider some new directions to avoid tunnel vision for the future of the Association. My reflections will begin with three observations: 1) the global overview of the workplace; 2) an overview of selected vocational education and training in Southern African economies; and, very briefly, 3) highlight an action plan proposed by the European Union to meet the potential challenges of the 1990s in the light of new demands on vocational education and the labour market. I will conclude with a proposal of a vision for IVETA for the 21st century. The intent is to stimulate further thinking and debate about a possible future role for IVETA.

The Workplace

The Workplace: A Global Overview

The first observation relates to the workplace. I will first consider the workplace from a global perspective, then present vocational education and training and the workplace in the context of developing Southern African economies. The new global workplace commands that employees plan their careers strategically. Jobs are less secure and confidence in lifetime employment with one organization is almost non existent. Downsizing, sometimes referred to as rightsizing, and restructuring are the current buzz words in the corporate world. Organizational restructuring influences employees as well as the ability of the organization to meet its work objectives (Stoltz-Loike, 1996). Labour market characteristics have changed and continue to change. Employees are more likely to be required to perform tasks that have high levels of social interaction and complexity. These tasks are associated with higher levels of education and continued learning and skill building (Stoltz-Loike, 1996). Thus, to remain marketable within the current global economy, employees must have a portfolio career that comprises diverse skills and relationships. Stoltz-Loike suggested that in the future job market, many individuals will not have lifetime jobs or careers. Rather, the jobs they hold will be defined by skills, talents, and organizational demands (p. 109).

Vocational education and training systems in the coming century must reflect these global workplace/marketplace trends. In the current and future global market-place, (1) an employee is competing with others both at home and away from the home country and the region, (2) an employee must continue to develop new, cutting-edge skills valued within the market place to succeed in the new workplace of the 21st century, (3) an employee must be abreast of the global trends that influence the success of business attempts, and (4) an employee must gain and utilize the skills to integrate business strategies from various cultures and environments for the 21st century global marketplace (Stoltz-Loike, 1996). Federal, state and/or local governments no longer give vocational education a high priority, therefore, business and industry must be willing to fill the void. Business must support this lifelong development process for employees in new and dynamic ways.

In developing economies, changes in technology and the unionisation of labour have influenced workplace needs. There is a lack of active participation and contribution of the private sector in addressing the future workforce needs. However, there is pressure for change by the governments to place more emphasis on vocational education and training for sustained economic growth and development to meet the rapid changes in production technologies and new methods of work.

The Workplace: The Context in Developing Economies

The compelling pressure on the governments of developing economies to embark on secondary school curriculum vocationalisation of the practical studies has often developed as a socioeconomic response to emerging features of structural unemployment. Policy makers in the Ministries of Education and Labour in developing economies tend to attribute youth unemployment and socioeconomic strife to lack of linkages between formal schooling and occupations in the workplace. Their thinking appears to be driven by the acceptance of the premise that schools have the mandate to prepare young people for full participation and membership in society. This implies that schools are in a position of responsibility for the employability of their graduates (Mndebele, 1994). Yet, business and industry have paid little heed to developing even the basic skills of future workers.

Vocational education and training in developing economies, particularly in Southern Africa, in terms of its potential contribution to the future economic development needs of the region, faces problems that are socioeconomic, political, and cultural in context. These problems can be summarized in the experience of Belize as observed and noted by Reneau and Finch (1996, p.9):

> The problem facing vocational education in terms of its potential contribution to the future economic development needs is the lack of participatory input from business and industry in terms of the role, content, and structure of future-oriented vocational education that would be in harmony with economic development trends and forecasts. A supporting problem is a current lack of clear legislated policy on vocational education as a comprehensive delivery system that addresses the future workforce needs.

The exclusion of business and industry from vocational education and training initiatives, in terms of planning, monitoring, and evaluation processes has led to public vocational training systems that are often insulated from competitive pressures and market signals. More often than not, this situation has resulted in high public training expenditures and a mismatch, inadequate provision of skills appropriate to the rapid changing needs of the economy. Business want more than just vocational skills. They want mathematical, communication, interpersonal skills. Are they willing to participate in support of education at all levels? Vocational education is a part of the total educational system.

The socioeconomic environment within which vocational education and training must be delivered is changing very rapidly for both industrialized and developing economies. As Southern African national economies become integrated into a more competitive international economy, policy-makers in these developing economies can no longer ignore the global economic forces when formulating education or vocational education policies. "Businesses are able to move their activities to wherever economic conditions are favourable, and jobs follow" (Salt, 1996, p.4).

Southern African nations now clearly see that the global economy is a reality and, in that economy, the pressures impacting upon national labour market forces may reside beyond the national geographic boundaries. That being on the increase, it behooves vocational education and training systems in Southern Africa to reconsider the assumptions, principles, and practices that undergird the delivery of vocational education. The thinking and mind set among policy-makers and trainers that there are job openings in the national economies waiting to be filled by vocationally trained graduates may as well be an anachronism at this point in time in the Southern African region.

Vocational education and training is pivotal for the Southern African nations to improve the international competitiveness of their businesses/industries which need to increasingly adjust to rapid changes in market opportunities; production technologies as well as new methods of work organization (Salt, 1996). Some of the problems faced by Southern African nations in improving the delivery of vocational education and training for higher productivity and sustained economic growth are (Salt, 1996): 1) Rapid technological change; 2) Depressed economic markets and heightened competition; 3) Rapidly growing populations; 4) Large numbers of displaced workers from other countries; 5) Low average literacy rates especially for women and rural populations; and 6) Insufficient wage jobs compatible with the expectations of young workers and their parents.

In responding to some of these problems and challenges, some of the countries have attempted to change their vocational education delivery approaches. They have adopted measures to enhance greater participation of the private sector in the planning of vocational education. Where such measures have been taken, there has been a reduction in government expenditures and a better fit between the demand and supply of required skills. One case in point is in Swaziland where an adaptation of the company-based training modelled after the German dual system was implemented at the Vocational and Commercial Training Institute - Matsapha (VOCTIM) as a European Union funded project under the auspices of the Germans (GTZ).

Vocational Education and Training in Southern African Economies: an Overview

The Challenge : Selected Problems of Vocational Education and Training

The second observation is about the problems, if you wish challenges, encountered by Southern African economies in the delivery of vocational education and training. Structural adjustment programmes in Southern African countries, in the context of vocational education and training, exposed glaring problems already in existence. Some of the selected major problems encountered by vocational education and training systems in different Southern African countries before structural adjustment programmes consisted of (Hoppers, 1996):

1) Limited scope of public sector training programmes in terms of range of training options where much emphasis is on conventional industrial trades and commercial subjects;
2) Poor quality and relevance of training being offered where facilities, equipment, and other training materials are obsolete; inadequately abreast instructors of new technological develop-

ments in business and industry; and programmes are not designed on the basis of pre-identified skill requirements;

3) Fragmentation of the training where institutional vocational education and training is carried out under the administrative controls of different government ministries, private and parastatal organizations and non-governmental agencies; systematic policy-development and planning affects only certain segments of the training providers; instructor training and supervision as well as labour market information services are poorly developed and benefit certain segments; there is no overall framework for creditation so that competencies are regionally recognized and provide for workers mobility;

4) Low level of systematic articulation with other training providers in the private sector, parastatal sector, informal/nonformal sector and nongovernmental organizations;

5) Insufficient linkages between vocational education and training programmes and other agencies promoting productive employment; institutional vocational training programmes are barely articulated with entrepreneurship education, credit facilities and business start-up schemes;

6) Underfunding of public vocational education and training where allocations from the public budget to such training have been too low to adjust to new technological changes and retaining of high quality personnel; the private sector contributes very little to public sector vocational training.

These problems and issues express concerns about the quality of vocational education and training in the Southern African region. The fact that there is a quality problem is endorsed by various quality improvement programmes, commissioned studies and projects undertaken by the national governments. The Economic Review Commission (1995) in Swaziland expressed the importance of linking education and economic development by stating that: "Sustained and sustainable economic growth requires the availability of skilled and productive manpower and, especially in Swaziland, there is a need to plan for manpower development so as to match the supply of skilled manpower with appropriate available jobs" (p.59). Changes underway in the new South Africa in the context of the National Qualifications Framework (NQF) endorse the concerns regarding the standards, credibility and relevance of their education and training system as stressed in the White Paper of the South African Government on Education and Training in 1995:

> "Successful modern economies and societies require the elimination of artificial hierarchies, in social organization, in the organization and management of work, and in the way in which learning is organized and certified. They require citizens with a strong foundation of general education, the desire and ability to continue to learn to adapt to and develop new knowledge, skills and technologies, to move flexibly between occupations, to take responsibility for personal performance, to set and achieve high standards, and to work cooperatively" (Adapted from Bellis, 1996, p.37).

In the last few paragraphs on vocational education and training in the Southern African region, I have endeavoured to describe selected salient problems and challenges that the region continues to encounter. This Region is probably not unlike others in the world. The description of the problems and issues point out that the approach used to deliver vocational education and training in the Region is the Bureaucratic Model rather than the Market Model or the Government-Steered Market Model (Schroter, 1995). However, I will hasten to say that Swaziland is experimenting with the Government-Steered Market Model or "Dual System" with the assistance of the German Government.

The Southern African region increasingly experiences pressures for change in the delivery of vocational education and training. Among other sources of pressure for change is the tightened dictate of the up-coming open global market competition in the region (Frey, 1996). The global market competition necessitates structural changes in the economies and societies of the region. Because of these economic challenges, the climate for foreign investment must be improved by providing investors with a cadre of competent and disciplined workforce. Another source of pressure for change is the high, and increasingly unaffordability of the cost of financing public institution-based vocational education and training. Governments, with shrinking budgets, can no longer afford to finance completely institution-based public vocational education comprising all trade areas.

The point of all this is that there are sweeping changes taking place outside the Southern African region that impact the region. The region can no longer simply look inward and toward its own markets and institutions. The region can no longer sit idle and get further behind in the global race for competitiveness. The cutting edge skill shortage in the region affects not only its competitive position internationally, but it also is an issue for foreign investment in the region. Nation states in the Southern African region, of necessity, must strive to prepare a work force able to compete with the best in the world if industry is to be attracted.

Vocational Education and Training: Challenges in the 1990s for the European Union

The third observation pertains a proposed action plan by the European Union to meet the potential challenges of the 1990s in the light of the new demands on vocational education and the labour market. The challenges for the European Union (EU) were expressed by Collins (1993). Collins articulated the forecast for the 1990s as economic uncertainty, turbulence, and restructuring with a response of "continuing change by industry and the EU's institutions through a reinforced education and training programme" (p.13). Some of the new demands on vocational education and the labour market by industry were to include multiple qualifications as reflected in the need for training providers to adjust and combine technical training with management and social training. Industries on the other hand would need to examine their organization of work which must change.

The action plan that was proposed by the Union to meet the potential challenges of the 1990s included (Collins, 1993):

1) The improvement of the **quality** of training needs to meet the growth of training needs;
2) **Comparability** of vocational **qualifications** in the Union to enhance mobility of labour, of trainee, of instructors;
3) **Transparency** of qualifications to enable employers to assess the relevance of skills and qualifications to the type of jobs available throughout the Union;
4) Development of exchanges and **linkages** to enhance sharing of expertise, and to establish cooperation between training providers and the business/industry sector.

A Shared Vision: The Challenge for IVETA in the 21st Century

With the background problems of vocational education and training in developing economies and the challenges of vocational education in the 1990s for the European Union, I would like to offer the International Vocational Education and Training Association a **vision** of the role of our professional Association in the next couple of years and into the 21st century. This vision asks: **What is the role of IVETA in the improvement**

of the delivery of vocational education and training in the 21st century? IVETA can contribute to preparing a work force able to meet the workplace training needs of the 21st century. Several potential contributions are worthy of mention:

- Facilitate the **exchange of information** among countries and thus broaden the range of alternatives beyond what might otherwise have been considered by any single country.
- Establish a framework for **international recognition** of vocational qualifications with **international credibility**.
- Facilitate the adoption of **common standards** to serve as guides for the establishment of internationally accepted outcomes.
- Promote and establish **formal linkages** between universities/institutions in different countries/regions for collaborative research, creation of research-related documents, and cultural competence.
- Formulate mechanisms for **networking** between governments/public sector and business-industry/private sector in workforce preparation.
- Formulate **alternative systems** of cost-sharing and cost recovery in the planning, delivery, monitoring, and evaluation of vocational programmes.
- **Liaise with donor** countries and agencies (e.g. UNESCO, ILO, GTZ, etc.) in support of vocational education and training systems in developing economies.
- Develop a **coherent and integrated framework** of vocational education and training relevant to the changing needs of developed as well as developing regional economies.
- Initiate regional/international comparisons of vocational qualifications for **transparency and mobility** of labour thus enabling employers to make informed employment decisions.
- Identify and analyse measures to improve **policy development** and formulation in public and private establishments to increase their policy-making capacity.
- Analyze existing vocational training situations to determine how they can evolve in the 21st century to accommodate: guidance of learners; recognition of prior learning; and provision of internationally recognized **standards** for educators and trainers.

- Facilitate equal **access** to vocational education and training of disadvantaged populations, and ensure their progression through the various levels of vocational qualifications.
- Champion the involvement of business and industry in all levels/types of education.
- Champion the importance of vocational education in all educational systems.

These statements represent my **vision** of the role of the International Vocational Education and Training Association for vocational education and training in the 21st century. These statements of a vision are imperative and will need to be interpreted into strategy and policy.

Summary

In summary, this paper attempted to highlight aspects of vocational education and training with implications for the 21st century. These aspects relate to the: 1) Changes in the workplace from a global perspective; 2) Selected problems of vocational education and training in Southern African economies that are exerting pressure for change in the delivery of vocational education and training; 3) Proposed action plan by the Union to meet the potential challenges of the 1990s in vocational education; and, 4) Vision of vocational education and training for the IVETA in the 21st century. The vision reflects a change in direction for the Association as an organization.

Change is normally the result of pressures on an organization, an institution, a country, a region. No significant change comes about without a desire to improve, a need to improve and pressure to re-think and re-shape or reconstruct. No significant change can come about unless the drive to change is well **focused in a clear vision** of what the future may look like, has to look like (Bellis, 1996). It is my strongest conviction that IVETA has the capability, and indeed the capacity, to effect change and indeed take actionable steps in the new direction(s).

In the words of Bellis (1996) regarding the importance of a clear shared vision, a point of view is expressed that: (1) with vision and capacity and action/plan but lacking pressure, the sense of urgency and of priority is lost; (2) with pressure and capacity and action but lacking vision, there is usually an impressive start, but no sustaining of the change process because it is unfocussed; (3) with pressure and vision and action but lacking capacity, there is a great deal of activity but frustration grows in the lack of capacity, and success becomes progressively harder to achieve; (4) with pressure and vision and capacity but lacking clear planning for implementable actions, there is likely to be a number of haphazard efforts and ineffectual initiatives (p.20).

Conclusion

I would like to conclude by stating that, in my opinion, the mission of the IVETA should be expanded to include the statements of vision expressed in this paper. My vision of the role of the IVETA in the 21st century includes a vocational education and training system or framework that looks inward and is responsive to the many and diverse needs of those it serves, while at the same time maintaining a perspective on the changing world. This vision acknowledges and indeed recognizes preparation for the challenge of a global economy. The vision is global, regional, and local, responding to the changing economic and technological conditions.

There is a need for change in the role of the International Vocational Education and Training Association in the light of the approaching new millennium. The changes or new directions proposed in this paper are rather substantial, may be even radical. To presume that the changes can be actioned quickly and with ease, would be to ignore the realities of existing situations within the Association. However, it is hoped that the proposed statements of vision will be perceived as opportunities that can enhance the value of vocational education and training, something toward which we can look, and work, and hope.

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Challenges of the 21st Century for Technical-Vocational Education and Training from Global, Regional and National Perspectives

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Abstract

The Human Resource Development (HRD) theory recognizes dynamic, innovative and flexible TVET as the ultimate engine of socio-economic growth and political stability. In order to meet the challenges of the 21st century and prepare a coherent TVET strategy, it is necessary to analyse existing and emerging critical issues and examine the experiences of the East Asia Tigers as a basis for working out strategies of TVET development in other regions of the world. Because of a broad range of ecological, social, demographic, economic and technological issues and challenges and an increasing demand for secondary education, technical education and female education, skills and competencies necessary to meet the challenges of TVET will not be achieved through traditional forms of TVET curriculum and provision. A multi-dimensional approach is necessary to meet the objectives. Against this background the paper discusses emerging trends in TVET, new demands on TVET teacher education and training, particularly the role of distance education, and key strategies for the future and the need for international and national cooperation.

1. Introduction

It is, indeed, my great pleasure to deliver this keynote address in this IVETA '97 meeting held in beautiful Helsinki, "a city in a beautiful nature setting". IVETA is an organization and network of technical-vocational experts and educators at all levels and from all around the globe. Helsinki is the ideal location to hold such a meeting as it is "where the West meets the East". In this age of global vision and global partnerships, IVETA is working hard to create a new global order for global partnerships in technical and vocational education. I am proud to be elected as the IVETA Vice President for Asia and honoured to be invited to this meeting.

Colombo Plan Staff College for Technician Education (CPSC), which is a unique inter-governmental organization of nineteen member countries in Asia and the Pacific region, was established more than twenty-three years ago to improve the quality and relevance of Technical and Vocational Education and Training (TVET) in the member countries. While celebrating the 23rd Anniversary of CPSC's founding, the President of the Host Government of the Philippines, HE Fidel V. Ramos, remarked that ***"there is no doubt anymore that social and economic progress of the Asia-Pacific region requires high quality innovative and relevant technology training and education systems"***. In spite of great geographical, economic, social and demographic diversities of the countries around the world, the relevance of the above remark remains applicable in almost all the countries, East or West, North or South. ***"In the twenty-first century, the quality of a country's human resources will determine its ability to compete in international markets and assure the well-being of its citizens"***, remarked Knight and Wasty in a World Bank paper (1991). TVET represents the best possible long-term investment for growth and human development.

2. Issues and Challenges for Human Resource Development and TVET

The Human Resource Development (HRD) theory recognizes the role of dynamic, innovative and flexible TVET for raising productivity as the ultimate engine of socio-economic growth and political stability. In order to meet the challenges of the 21st century and to prepare a coherent strategy of TVET, it is necessary to examine the existing and emerging critical issues and examine the experiences of the East Asia Tigers. We may develop strategies of TVET development in other regions of the world in the light of experiences gained in East-Asian countries.

The issues which are critical in the context of the Asia-Pacific region and which may also have a profound effect on TVET in the next millennium in many other regions of the world, include:

- population growth and rapid urbanization;
- poverty and lack of skills for income-generation;
- increasing demand for secondary education, technical education and female education;

- technological change and labour market shift;
- international labor migration;
- changing patterns of international trade, liberalization and globalization of the workforce;
- pollution and environmental degradation;
- new technologies of training for TVET education.
  - Global environmental problems, particularly the greenhouse effect, ozone depletion and biodiversity loss, which are intensifying the threat to already widespread environmental degradation in the region.

3. Emerging Trends in TVET for the 21st Century

Skills and competencies necessary to meet the challenges of TVET will not be achieved through the traditional forms of TVET curriculum, delivery, and its systems. A multi-dimensional approach is necessary to meet the objectives. These will include:

- more broad-based and flexible curriculum replacing skill-specific training programs;
- integration of training and education in cooperation with industries and private sectors;
- life-long and flexible learning to enable the professionals to meet the higher and varied demands of the job;
- knowledge and skills of using new technologies of training and education including the computers;
- development of multi-lingual and communication skills;
- increased emphasis on development of work ethics, teamwork, human values and other non-technical competencies like leadership, time management, environmental awareness, etc.
- development of self-employment and entrepreneurial skills.

4. New Thrusts on TVET Teacher Education and Training

The demands on TVET teachers' competence, professionalism, attitude, values and work ethics in the context of new and emerging technologies in the region as well as the globalization of the workforce would impose enormous responsibilities on TVET teachers in the 21st century. In many countries, quantitative expansion of TVET has put much pressure on quantity and quality of TVET teachers. Planning and implementation of reforms in TVET teacher training will require effective partnerships among: a) national planners; b) TVET institutions; c) teachers' organizations; d) media experts; and e) international agencies. The question is how to forge that partnership?

The role of technical and vocational education teachers is undergoing a radical change. Teachers are no longer just dispensers of information. They are expected to be curriculum designers, student counsellors, educational and resource managers, internet operators, and vocational practitioners. A recent UNESCO-UNEVOC Round Table Expert Group Meeting (1997) in Brazil on Training of Technical and Vocational Teachers, highlighted the need for innovations and quality improvement in TVET teacher training programs to meet the challenges of the next century. Some of the countries have opted measures to cope with the emerging situation of teacher training. These include:

- recruitment of teachers from the world of business and industry;
- providing pre-service and in-service training with greater emphasis on practical skills training;
- establishment of closer links between institutions and industries for skill development of the TVET teachers;
- wider application of competency-based teacher education programs;
- focus on attitude, values, work ethics and non-technical competencies in TVET teacher-training programs.

As a result of a careful review, distance education has been adopted as a necessary supplementary mode to meet some of the critical needs of teacher-training in many countries. Perhaps the most famous of the existing Distance Learning Institutes is the United Kingdom Open University, started in 1968. It has many imitators, mostly nationally funded. Printed material is still the major learning material, although recent courses have used increasing levels of technology. There is an interesting list published of the ten leading mega-universities of the world, many with similar structures to the Open University.

Some key factors about the Open University are interesting.

- degrees are offered in many areas
- over 200,000 students are involved
- much of the learning is in the student home
- larger 'classes' have close to 10,000 students
- study centers are available for providing individualized human attention
- non-degree courses are now available
- costs per student are far less than in traditional universities
- graduates compete well with those from traditional universities

The objectives of the distance learning program for TVET may include:

- to update and upgrade a large number of serving technician teachers, teacher educators, and key personnel responsible for management and quality improvement of technical-vocational education and skills-development;
- to have convenient and continuing access to advance training which are of immediate relevance, cost-effective, and reflective of prime concerns of the developing member countries of the region;
- to contribute towards developing a cost-effective model for establishing distance education resource centre for technical-vocational education and skills-development;
- to promote innovations, research, and development for improvement of quality and relevance in technical-vocational education;
- to support technical cooperation among developing countries for designing appropriate methods and materials for distance education;
- to establish a network of international and national organizations for distance education for TVET.

Considering individual constraints and job requirements of technical workers, most of the continuing education programs may be given as on-the-job programs. To accommodate variable requirements, programs should be flexible in nature. The flexibility is provided in selecting the contents, time and duration of study, place of study, strategy (method and media) for study, etc. The learner should have the flexibility in choice of course content according to job requirements. This flexibility helps to motivate the learner to take part in the program.

5. Key Strategies for the Future

Looking ahead towards the 21st century and in the high tide of the Information Age, it is important to establish:

a) stronger linkages between technical and vocational education and the world of work;

b) stronger linkages between technical-vocational education and the general education in basic and secondary education systems;

c) greater efforts to develop income-generating skills, particularly in rural areas, for poverty alleviation;

d) greater effort to improve participation of women, handicapped people and other disadvantaged groups in skill-development programs;

e) continuing system of curriculum renewal in the context of rapid changes in technology and the challenges of open global market economy.

To meet the demands and responsibilities of the 21st century the TVET teachers also must change and re-equip themselves on a continuing basis with broad based and flexible technical competencies, attitudes, and values as required in a global marketplace. Reforms of TVET teachers/trainers take priority in meeting the challenges of the 21st century.

6. Need for International and National Cooperation

National, regional and international agencies and NGOs must work together in a spirit of close partnerships to meet the challenges of TVET and Human Resource Development in the 21st century. IVETA, as the global organization of TVET practitioners, must take a lead role and establish a global network in this formulation of international partnerships. We, as individual members of IVETA, have important roles to play in that process of international cooperation.

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A Customer Oriented Approach for Curriculum Development in Vocational Education

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Abstract

The main purpose of the study is to validate the application of using a total quality management (TQM) approach to develop a computer numerical control (CNC) course. This research started from the document analysis in total quality management and curriculum development theories. Based on the results of document analysis, a model for vocational curriculum development was constructed. By using the model developed, an action research method was administrated, and a computer numerical control course was chose. A committee was founded that include the external customers for the CNC course, the members include employers, domain experts, and students graduate from the program. During a half day meeting, the members determined the objectives and outlines for the CNC course. In the final stage, considering the objectives and outlines, an interview method was administrated. Teachers, as the internal customers were interviewed, and the course outlines were revised. This research provided a model to develop a CNC course to meet the customers' need, and offers a possible way to improve the quality of vocational education.

Purpose of the Research

In recognizing the challenges of the 21st century for vocational education, the purpose of the research was to construct and validate a customer oriented approach for curriculum development in vocational education, so that the instructional quality of vocational education can be improved, and the customers' needs of the vocational education can be satisfied.

The Theory and Concept

Total quality management (TQM) can be defined as a philosophy of quality improvement, is based on the customers' needs to get top management commitment to continuous to improve the quality of product or service. The key components of TQM approach are: (a) Customer driven quality (b) Top management commitment (c) Participation and communication (d) Decision making based on facts (e) Continuous improvement (f) Culture change (Chao, 1994; Deming, 1993a; Deming, 1993b; Juran, 1988; Sashkin & Kiser, 1991).

When considering to use the TQM approach in education, there are several key points must be considered by the educational professionals (Chao, 1996): (a) Internal and external customers for a course must be determined carefully. (b) Systematic processes for a course design and development must be ensured. (c) Top management must have TQM and instructional knowledge and fully support the teachers. (d) Data collection and analysis techniques must be trained to the teachers.

The researcher based on the total quality management approach that comes from the business sectors, utilizing the concepts such as customers driven quality, continuous improvement, participation, decision making based on the facts, system oriented, and so on, a vocational curriculum construction model (Figure 1) was finally developed. (Chao, 1996; Chao & Dugger, 1996). According to the model, this research completed the analysis and design stages for the computer numerical control (CNC) course.

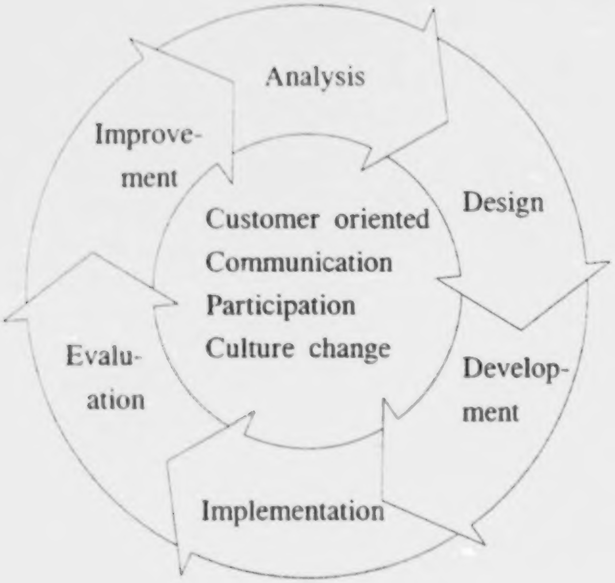

Figure 1. Quality Instruction Model

Methods and Procedures

In the first stage of the research, the document analysis method was used. The concepts of total quality management, curriculum development techniques such as DACUM approach, and task analysis were analyzed. According to the results of document analysis, a theoretical model for vocational curriculum development was constructed by the researcher. This model emphasize the needs of the customers. The holistic processes include the customers' need analysis, instructional environment analysis, objectives design, outlines determination, and evaluation.

In the second stage, a computer numerical control course in the vocational high school was chose. Considering the model developed, the qualitative and quantitative methods for the validation process on the analysis and design stage were administrated. An external customers participation method was utilized in the analysis stage, so that the objectives and content outlines for the computer numerical control course can be determined. The seven external customers include the employers from the industry and the domain experts in CNC. Considering the results of interviewing, the outlines for the CNC course were determined. In the final stage, an evaluation procedure was conducted by the researcher. The internal and external customers were involved to ascertain the validity of the CNC course.

Finding and Conclusions

After the research was conducted, two parts of the results were concluded.

Part 1. Results of CNC course analysis

The objectives and the course units for the CNC course were concluded. The objective for the course was to construct the following abilities for the students:

1.Operation ability on CNC hardware system
2.Programming ability on CNC software
3.Tooling and maintain ability
4.Positive attitude toward CNC trade

After finishing the objective discussion, a cause and effect method was used, and the key course factors of the CNC course were determined as Figure 2.

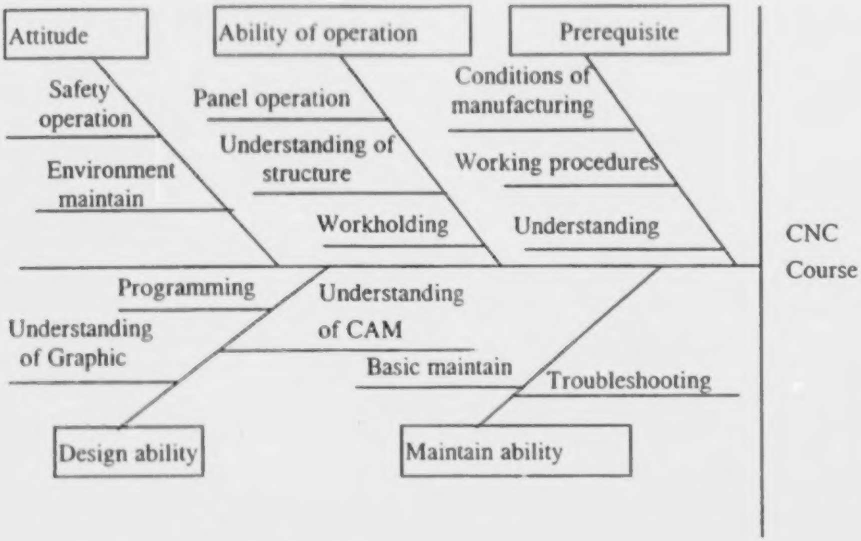
Attitude
Ability of operation
Prerequisite
Safety operation
Panel operation
Conditions of manufacturing
Environment maintain
Understanding of structure
Working procedures
Workholding
Understanding
CNC Course
Programming
Understanding of CAM
Understanding of Graphic
Basic maintain
Troubleshooting
Design ability
Maintain ability

Figure 2. Key Factors for the CNC Course Learning

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The course outlines for the CNC course included:

1. Introduction to numerical control
2. Hardware and software for NC system
3. Foundation for NC programming
4. CNC turning programming
5. Machine center programming
6. Tooling for NC system
7. Basic operation for CNC turning machine
8. Basic operation for machine center
9. Computer aided manufacturing and CNC
10. Maintain and safety requirements for CNC

Part 2. The conclusion toward the customer oriented approach:

1. Customer oriented approach can be used to develop a quality curriculum in the vocational education.
2. Participation from the external and external customers in the developing process is very important. The external customers involved in the objectives and outlines' analysis can ensure the needs can be reached. The internal customers' involvement can offer the feedback information to improve the course.
3. The quality management techniques, such as Brainstorming, Cause and effect diagram, Flowchart are very useful to construct a curriculum.
4. By using the customer oriented approach, the time spend in the process was changed from two days to a half day period. Therefore, the budget in curriculum development can be reduced.
5. Based on the customers' need, the course evaluation can be easily assess before starting the course implementation.

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Banking Education and Training in Hong Kong: A Profile and Its Challenges in the 21st Century

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Abstract

Even though Hong Kong is one of the world's financial centres, there was no study on the banking education and training. The aims of this study were therefore to outline the profile of banking education and training in Hong Kong. For banking education, the nature of the courses was reviewed. A survey to identify the training practices of the banking sector was carried out in April 1997. In the survey, the following aspects of training were investigated. They were: the investment; the methods of identifying the needs; the aspects in which training are required; the incentives; the training provided to staff from and to China; the difficulties and future challenges. Recommendations to both the educational and banking sectors were then given.

Introduction

Hong Kong is one of the world's leading financial centres. In 1994, there were around 119,000[1] people working in the Hong Kong banking sector. According to the Vocational Training Council (VTC) 1994 survey, there was a total of 70,000[2] times of in-house and external training offered. Despite the importance of quality of staff in the development of banking, there seems no studies on the banking education and training. The only noticeable one was the bi-annual manpower survey done by the VTC. However, the survey emphasised mostly on the amount of manpower required by the sector. With the return of Hong Kong to China, the opening up of the China financial market and the increasing exchange of staff between the two places, the types of training are bound to be different. Hence, the objectives of the survey were:

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[1] Hong Kong Government, *Hong Kong 1995*

[2] Vocational Training Council, *1994 Manpower Survey Report -- Banking Industry*

1. To review the banking education in Hong Kong.
2. To analyse the training and development programs provided by banks.
3. To identify the challenges and future development of banking education and training.
4. To identify the ways through which the banking and education sectors can improve banking training and education.

Methodology

The study was basically divided into two parts. The first part was a review on the banking education in Hong Kong. The second one was a survey on the training practices of the banking sector.

The Hong Kong Banking Ordinance classified the banking sector into three types of financial institutions (FIs). They are the licensed banks (LBs), restricted licence bank (RLBs) and the deposit taking companies (DTCs). Licensed banks in Hong Kong are similar to commercial banks in other parts of the world. Restricted licence banks specialised in merchant banking business. The deposit taking companies concentrated in consumer credits. As their business emphases are different, the types of training would also differ. More information and better planning can be done if the needs of the three types of institutions can be identified separately. However, for easy purpose, for the rest of this paper, the word "banks" refer to all three types of financial institutions unless otherwise specified.

In April 1997, a total of 184 questionnaires were sent to 91 licensed banks, 61 restricted license banks and 62 deposit-taking companies. This sample represented half of the banking sectors. These companies were selected randomly from all the financial institutions listed in the February 1997 Monthly Statistical Bulletin published by the Hong Kong Monetary Authority.

The Banking Education in Hong Kong

In Hong Kong, professional education is classified into three levels. They are: the bachelor or above level, higher diploma/higher certificate level and the diploma/certificate level. The distinction between diploma and certificate lies only on the mode of study. Diploma usually indicates a full-time study, whereas, certificate is usually a part-time one.

At present, the major providers of formal banking education are government subsided post-secondary institutions. On the undergraduate level, the Lingnan College offers a full-time course. The Opening Learning Institution extends a part-time course. In addition, the Polytechnic University is proposing to offer a bachelor course in finance in September 1997. On the higher diploma/higher certificate level, the City University offers both full-time and part-time courses. The Chai Wan Technical College extends a part-time course. On the certificate level, one Technical Institute provides part-time course.

Though they are all subsided by the government, they are under the scrutiny of different bodies. The City University and the Lingnan College are funded by the University Grant Committee. The Technical Colleges and Technical Institutes are supervised by the Vocational Training Council (VTC). There seems little co-ordination among them.

For informal banking education, the Bank Training Centre of the VTC will provide short courses for existing bank employees. Other short or informal banking courses are provided by a number of independent profit-making organisations. The Hong Kong Institute of Bankers, the professional body, offers short revision courses and seminars.

Training Practices of Banks in Hong Kong

A survey was conducted in April 1997 to investigate the training practices of banks in Hong Kong. A total of 184 questionnaires were sent. Eighty of them were returned and useful, representing a response rate of 43%.

Training Department/Section

Around two-third of licensed banks and restricted licence banks had set up training sections/departments. However, majority of them only had 2 to 5 persons in the section. Around one-third of both types of banks did not have their own training sections. For the deposit taking companies, only one-tenth of them had such sections.

Training Methods

Eighty-four percent of the sample had utilised external courses for training. Though majority of the deposit taking companies had no training department, over two-third of all the deposit taking companies used external training courses. This indicating that there should be a great demand on external training courses. In-house training courses and job rotation were the second and third most popular training methods.

Methods of Determining the Training Needs

Most financial institutions used performance appraisal and the company's direction, to identify the training needs of their staff.

Training Needs of Staff

Conceptual skills, technical skills and attitude change were the three areas required training most. Most of the institutions also felt that their staff needed training in clerical/secretarial skills, English and Putonghua.

Encouragement for Training

Though the institutions were in the opinion that their staff required training in various aspects, only around half of all them would reimburse and give education allowance to their staff.

Training Budget

Only 5 banks and 1 restricted licence bank were willing to disclose their training budget. For all those who were willing to disclose, the budget was less than 2%.

Staff from Mainland China and Training Provided to Them

Less than one-third of the institutions had employed staff from Mainland China. As the institutions were able to recruit very well qualified staff from China, less than half of them thought that the Mainland staff needed training in both English and Cantonese.

Staff to Mainland China and Training Provided to Them

As the setting up of representative office or branch in China need approval from the Chinese government, slightly more than one-third of the institutions had sent staff to Mainland. Since these institutions usually selected more capable staff for placement, only very few institutions provided training to them.

Difficulties Faced by the Training Departments

Around one-third of the institutions perceived that the shortage of training experts and insufficient commitment from trainees caused difficulties in training. About one-fourth of the institutions found insufficient budget and lack of training materials problematic.

Possible Help from Educational Institutions

Over half of the institutions believed that the education institutions could ease their problems by providing courses on technical skills, language skills and conceptual skills. Two licensed banks specifically mentioned that the educational institutions might provide courses on training the trainers.

Co-operation with Educational Institutes

Though overwhelming majority of the institutions were willing to sponsor staff to attend short courses provided by educational institutes, only half of them were willing to sponsoring staff to attend longer term courses. Very few licensed banks were willing to second staff to educational institutions. None of the financial institutions would accept staff seconded from educational institutions.

Future Challenges

Over half of the institutions regarded that the rapid technological change and environmental changes were the future challenges of banking training. Furthermore, rapid staff turnover still remained as one of the challenges in future.

Findings and Recommendations

The Hong Kong banking sector did not regard training as an important function. Yet, majority of the financial institutions felt that their staff needed training in various aspects. Fortunately, around half of these institutions were willing to encourage their staff to attain training by reimbursing them. Hence, it seems that the burden of providing banking training will be rested on the education sector. Recommendations to enhance banking education and training were given below.

To Banks

1. More investment and better planing in training.
2. Provide more incentive to staff to attend training.
3. More co-operation with the educational institutions.
4. Prepare for training staff from and to China.

To Educational Institutes and Professional Bodies

1. Provide various short-term courses and workshops.

2. Provide courses leading to formal qualifications in a flexible manner.
3. Provide train the trainer courses.
4. Collaborate with banks to provide training materials.
5. Provide courses for mastering technological changes.

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Environmental Education for Sustainability

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Abstract

All providers of vocational education and training should have a strategy for including environmental education throughout all programmes, in order to contribute to the challenge of ensuring global sustainable development throughout the 21st century. This paper illustrates the development of a widely applicable curriculum unit of environmental education for sustainability, for environmental protection. The Unit comprises five generic general learning outcomes together with related more specific outcomes. Development of the Unit involved drawing on the experience of teachers of a range of vocational programmes, and articulating with views on the aims of environmental education and the growing emphasis on the importance of environmental responsibility. The Unit could be implemented as a self-standing curriculum, but more desirably the outcomes integrated into vocational programmes.

Introduction

Perhaps the biggest challenge facing all nations as we approach the end of this century, is to ensure that at the end of the 21st century the health of the planet is at least as good, and even better, than it is today. It is a challenge for vocational education to play an influential role in ensuring that this will be so.

The crucial importance of environmental education has been well identified through the outcomes of the United Nations (Rio) Earth Summit (1992), the European Community Resolution, 88/C/177/03 (May 1988) and in the UK, for example through the Government Strategy for Sustainable Development(1). With regard to the sector of education which provides much of the vocational education and training in the UK, a national report 'Environmental Responsibility - an agenda for further and higher education (1992)'(2) recommends that every institution of further and higher education should have a strategy for promoting environmental education across the curriculum. A review of progress indicates that colleges are not finding it easy to implement such a strategy when there are other pressing requirements to increase student participation and achievement within financial constraints.

In its role to support development in colleges FEDA's predecessor body, the Further Education Unit (FEU) published a guide to environmental action in FE colleges(3) drawing attention to the moral principle of sustainability, which includes a duty of care for other people and forms of life, and acknowledges the need to limit and share the use of the earth's resources. FEU also began a project, completed by FEDA to develop a widely applicable core of environmental education which can be built into the curriculum of all students as an essential part of their vocational education (or general education) programme.

The Development of a Core of Environmental Education

Choosing the Content

The chosen content takes account of:

- the views of practising teachers of vocational education who were including environmental issues in their teaching programmes;
- discussion of the aims of environmental education as identified nationally, and internationally;
- what is essential learning for both young and adult students who may be employed or preparing for employment in a variety of work situations;

- the need to build on a student's previous learning and awareness from their school curriculum or elsewhere;
- the key dimensions of a vocational environmental education course developed as a result of a transnational project between Rochdale, England and Bielefeld, Germany, which include management of resources, energy use, pollution, legislation, health and safety, people;
- a profile of the 'active citizen'(4) including - global perspectives, self-confidence, openness, justice and equity, cultural awareness, information skills, communication, working with others, planning and executing, evaluating.

Presenting the Curriculum
The presentation of the content was influenced by the FEU/FEDA's development of proposals for a credit framework for all qualifications in which achievement is expressed as units of learning outcomes. Learning outcomes define intended achievement of knowledge, understanding, skills and attitude change. These learning outcomes may be written in general or more specific terms and it has been found useful to write them in three categories: general learning outcomes, more specific learning outcomes, and assessment criteria which enable students' achievement to be measured.

The outcome statements determine how demanding the Unit is for the student. The following Unit of outcomes is designed for achievement at Level 3 in the qualifications structure in England and Wales i.e. for a student's achievement at, say, age 18-19 or beyond, or before entry to a university degree programme or professional qualification. Each general outcome is accompanied by a number of more specific outcomes. In the full specification the range of knowledge and understanding required is added (Figure 1).

The Unit of Environmental Education for Sustainability

The five chosen general learning outcomes are:

1. Understand the importance of natural processes, relationships and resources that exist in the environment. This general learning outcome requires an understanding of the natural processes that take place in the environment, and an awareness of the interdependence of all species, individual communities and nations. Those who understand these issues will manage resources and materials effectively, prevent waste and recycle materials. Processes in the natural world are inter-connected. It is the activities of human societies, which threaten these relationships and balances. The awareness that nothing in the environment remains static and unmoving is important in understanding problems of pollution and personal responsibilities as a consumer of resources.

2. Evaluation the environment impact on the activity. Environmental audit or review is a central process in taking environmental responsibility. The review process does not have to be complex but many of the environmental problems that face us today are due to lack of knowledge and concern for the consumption processes. To achieve environmental protection and sustainability requires an understanding of the processes that create goods and services and an acknowledgement of our integral role as employees and consumers.

3. Analyse how past decisions and activities affect a local environment. It is important to appreciate the long term consequences of decisions and actions, and also how local actions may contribute to global effects. Perspectives may include social, cultural and industrial components.

4. Interpret the legislative framework which exists to protect the environment. Environmental legislation has implications for most vocational areas. The student should understand the principles developed to meet national and international requirements - eg the concepts of 'the Polluter Pays Principle', 'Integrated Pollution Control', 'Best Practicable Environmental Option'.

5. Identify economic and social benefits of good practice. Students should be able to identify good environmental practice and an understanding of sustainable development. Often this may require an understanding of different cultures and view points.

Implementation

The Unit can be implemented either as a free-standing, self-contained curriculum, or by integrating the individual outcomes into a vocational programme. Adopting such a Unit would enable environmental education for sustainability to be addressed with achievement by all students throughout an institution.

The general and specific learning outcomes remain the same whatever the vocational area but the assessment criteria which qualify the outcomes are likely to vary according to the application to reflect the context adequately. For example 'Evaluate the environmental impact of an activity' may involve assessing the impact of either the manufacture of a fabric or garment in a Fashion and Textiles course or a meal or recipe as part of a Hotel and Catering course.

As a further example, the specific learning outcome: 'Explain the ways in which past activities and decisions have shaped the environment of the present day' may, in an assignment on Road Building Policy in a Business and Finance course, have an accompanying assessment criterion, 'State existing traffic flow problems and analyse their effect on the environment and the community.'

Some further examples of titles of assignments to achieve the outcomes in various programme areas are: An exhibition on local issues (Business and Finance); Casement windows (Carpentry and Joinery); How green is my college? (Diploma in Design); Textile finishing processes (Fashion and Textiles); The impact of tourism (Leisure and Tourism); Trees in the environment (Nursery Nursing); Waste disposal (Waste Management).

Conclusion

This approach can enable teachers to integrate environmental education into vocational provision in a way which will enable curriculum managers and students' achievement to be assessed. Development work continues, and comments on the Unit, or examples of related developments will be welcome. Further details are available from FEDA(5) and from the authors.

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5 Environmental Education throughout FE 2: A model and unit of environmental learning outcomes FE Matters Vol 1 No. 2, FEDA 1996, ISBN1361 9977

General learning outcomes	**Specific learning outcomes**
The student should be able to:	
1 Understand the importance of natural processes, relationships and resources that exist in the environment	Explain the importance of the cycles of matter and energy supply Explain the need for management of finite resources Relate the above to global consumption, population dynamics and industrial and social processes Be aware of the interdependence of actions by individuals and communities and the environmental consequences and opportunities of these relationships
2 Evaluate the environmental impact of an activity	Evaluate the impact of action in terms of environmental, economic, social and aesthetic dimensions Select options and justify good environmental practice Evaluate potential changes in vocational, personal, and national behaviour
3 Analyse how past decisions and activities affect a local environment	Explain the ways in which past activities and decisions have shaped the environment of the present day Evaluate relevant historical perspectives and events Identify the conflicts that arise from environmental issues and consider ways to resolve such conflicts
4 Interpret the legislative framework which exists to protect the environment	Apply the principles of the relevant environmental legislation Work (or identify good practice)within the principles of the relevant legislation
5 Evaluate economic and social benefits of good environmental practice	Relate the concept of sustainability to local, national and global environmental issues Evaluate conservation, re-use and recycling in an economic and social context

***Figure 1.** Environmental Education for Sustainability (Environmental Protection): General and Specific Learning Outcomes, Level 3*

Global Trends in the Workplace: Impressions of Workforce Education Systems

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Abstract

Global trends and impressions of workforce education systems in Britain, France and Germany will be the focus of this presentation. During the summer of 1996, educators from Egypt, Guam, North Carolina, and Texas visited with leaders and scholars involved in designing and implementing the workforce education systems in western Europe. This presentation will focus on the collaboration of business and industry with education in European cultures. The following learning activities were used to gather data for this presentation: 1) participants' learning contracts, 2) journal notes of daily events, and 3) an evaluation instrument. The data for this presentation was collected from an International Study Institute on Workforce Education and Training.

Introduction and Purpose

During the summer of 1996, a small group of educators (N=9 - two Texas Aggies, an Egyptian female, a woman from Guam, one WASP, one African American professor, one Betty Crocker homemaker, and two consultants) disembarked to western Europe to explore differences between British, French, and German cultures in the areas of workforce education and development. This unique project was a field-based graduate course designed to increase the knowledge base of educators on the effectiveness of workforce development programs for youth making the transition from secondary and postsecondary education programs to the workplace.

There were many similarities, some interesting differences, and few surprises along the way. The group's insights, as well as a glimpse of their emotions, will be reported as excerpts from the journals each participant used to record daily events. In addition, each participant had to complete and sign a learning contract as described by Knowles, 1975 and Brookfield, 1985.

"Sometimes, said one participant, you must leave your country for a while in order to understand both yourself and your country better..."

Establishing institutional and personal links that foster international exchange of new technologies and teaching developments as well as exploring cultural differences in the European community are focal points of this project. The focal points can be best described by the five instructional objectives completed by the participants. For example, the participants: 1) explored differences between British, French, and German cultures in the areas of workforce education and development; 2) conducted on-site reviews of various academic and technical programs surrounding workforce development in Britain, France, and Germany; 3) exchanged professional materials and instructional ideas with secondary and postsecondary leaders of various workforce education and training programs in western Europe; 4) participated in workforce development seminars with English, French, and German scholars at selected colleges and universities in western Europe; and 5) examined the roles of business and industry in collaboration with education in European cultures.

Conceptual Framework

The conceptual framework for this project was based on self-directed and experiential learning approaches as described by Malcolm Knowles (1975) and Stephen Brookfield (1985). According to Knowles, self-directed learning is a process by which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating outcomes. As adult learners, the participants were mature enough to be responsible for their own learning and thereby self-directed. Case in-point, participants developed and signed a learning contract describing their learning plans or activities to fulfil the requirements for completing this project. Moreover, the learning contract, according to Brookfield, is the chief mechanism used as an enhancement of self-direction. Other scholars who support Brookfield's assertion are: Knowles (1984) in adult education, Berte (1975) in higher education, Galbraith and Gillery (1985) in training settings, and Sawyers (1985) in religious education. They all agree that learning contracts are the most effective technique for assisting students to diagnose their learning needs, plan learning activities, identify and select resources that are relevant and appropriate, and become skilled at self-evaluation.

Self-directed learning may also be described as non-structured learning or a learning process without boundaries. Typically, we think of learning as that which takes place in school. However, during the 21st century, we must think of learning as being the same as living. In other words, we must learn from everything we do, both formal and non-formal learning settings, in order to increase our personal and professional growth and development. The learning settings for this project were the international communities of Britain, France, and Germany which served as outdoor classrooms for many unforgettable learning experiences.

The roots of self-directed learning are embedded in the concepts of experiential learning which began with apprenticeship and the craftsman guild. Experiential learning may be defined as learning from experience or learning by doing, according to Lewis and Williams (1990). It may also be defined as learning in which the learner participates and is directly in touch with the realities that are studied (Brookfield, 1984). Moreover, experiential learning has always been manifested in vocational education and training. Emphases on practical application of knowledge and hands-on learning are the under-pinning of the profession.

Significance of Project to Vocational Education and Training

Results from this project should provide vocational educators with insight that could be useful in initiating, improving, implementing, and maintaining successful links and partnerships with the global community. The dynamics of the workplace is changing rapidly into a multicultural environment with vocational education and training as the major provider of job readiness skills for the workforce. Cultural diversity in the workplace will be a common occurrence in the 21st century.

An educated workforce is essential to the survival of a nation. The global competition in the marketplace will demand that all nations have an educated workforce in order to be competitive. The high performance demands of the next century dictate a need for technical skill workers with high-tech employability skills.

Increasing the knowledge base of vocational educators on the effectiveness of workforce development programs for youth making the transition from school to the workplace should have a major impact on the profession, regardless of one's nationality.

Methods

The self-directed and experiential learning designs provided the framework for developing and implementing the project. The development and implementation consisted of three major components: 1) academics, 2) financial, and 3) evaluation. In reference to academics, each participant developed and completed a learning contract, focusing on personal and professional goals, relating to how students are prepared for making the transition from school to the workplace in Britain, France and Germany. Participants also composed a journal of field notes of daily experiences and learning activities to share with colleagues in an informal small group session.

In reference to financial arrangements, the W.K. Kellogg Foundation provided partial support for the project. However, each participant paid for travel, lodging, and food. The Kellogg grant was used to pay for consultants, instructional supplies, and other on-site services. A final report was submitted to the Kellogg Foundation, outlining the learning activities and results of the project.

The evaluation component provided the accountability to continue future projects of this magnitude. Each participant completed an evaluation instrument consisting of 10 items that were designed using a one to seven-point response scale, with one being the lowest and seven the highest response rate. In addition, the participants responded to three open-ended questions, i.e. What did you like most about the project? What did you like least about it? And how could this particular project be improved?

Findings and Conclusions

The purpose of this experiential and self-directed learning project was to acquire a better understanding of how educators and leaders in Britain, France, and Germany prepare students to make the transition from school to the workplace. The findings are based on the completion of five objectives stated earlier in the introduction of this paper. Seventy-eight percent of the participants completed the evaluation instrument and indicated that the project had met their expectation and stated goals. Moreover, constructive comments were made in their journal excerpts to strengthen the development of future projects of this nature. For example, one participant wrote, *In planning for future activities in, it may be wise to explore more in depth learning activities in 2-3 areas in Europe. Four areas in 19 days may be too exhausting. However, on an overall basis, this first international study institute* *has afforded me an opportunity to gain more experience in not only workforce development in western Europe but also in creating goodwill and understanding.*

Other findings revealed that there were many commonalties between France and the United States. The French industry has shifted from an industrial to service economy. Problems with drug use among young people and a problem with the migration of underprivileged, undereducated natives of other nearby countries were similar to the problems between the United States with Mexico and Cuba.

In Britain, at the University of London Library, it was surprising to find that most of the emphasis was on workforce education materials, racks upon racks. The University of London is really a conglomeration or consortium of smaller colleges. The library also had extensive four-colour training materials and other resource materials which could be used to teach literacy in the United States as well as Great Britain.

In Germany, apprenticeship programs played a major role in the German's workforce education system. The findings revealed that Germany placed more value on apprenticeships than we do in the United States. However, during 1995, about one-third of the employers formerly associated with the German Chambers of Craft withdrew support. Like employers all over western Europe, they were seeking more economical means of securing employees because the current apprenticeship system takes too long and costs too much.

In conclusion, it was noted that there are trends in western European countries with similarities to those in the United States. For example, western European managers understand that teamwork, problem-solving, decision-making, computer literacy, and language skills are the keys to enhancing productivity. They want people who adapt well to change and who are continuous learners with high work ethic. Migration problems were being experienced by the various countries. The problem surfaced because of the increased competition among countries for jobs. For example, German companies were moving across the border to get higher skills and lower wages. Internationalism among companies was a way of life. European employers want their workers to speak at least three languages. And almost every company visited was either international or aspired to be.

Finally, western European leaders are interested in ways to reform workforce education for 14-26 year olds. They are faced with global social problems (i.e. heavy drug abuse, lack of work ethic, and the right training to match workforce needs).

Summary

Employers in Britain, France, and Germany have similar expectations of their employees as do the employers in the United States. Employers in western Europe want and expect employees to: have the equivalent of a bachelor's degree, have five to seven years of experience, speak at least three languages, be able to adapt well to technology and perform as a member of a team, possess problem-solving and decision making skills, be 30 to 34 years of age, and be willing to work for minimum wages.

Global competition has forced companies in western Europe to explore new or more efficient ways to train and manage. These concerns are also on the *front burner* among employers in the United States. An educated workforce is a must for all nations to successfully compete in the global economy of the 21st century.

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Intersectoral Approach to Literacy and VET: The Case of the Sudan

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Abstract

Human resource development is crucial for the socio-economic advancement of the mankind. Illiteracy rate is high in the Sudan (59 % among men and 80 % among women), the adult education curriculum has been prepared and administered via joined venture and intersectoral collaboration among the Ministry of Education (MOE), Ministry of Labor (MOL), and the Ministry of Social Planning (MOSP). The curriculum has emphasized literacy classes and various vocational training skills for both men and women. The curriculum is being pilot tested via the adult education centers run by the (MOE) and the youth training centers run by the (MOSP). Both centers are found all over the country. The (MOL) provides technical assistance in terms of workshop equipment and trainers. The program is fully supported by the government with an assistance from the (ILO/UNDP) fund. A comparative study was done and reflected high attendance rate in those intersectoral collaboration centers compared to the normal adult education and youth training centers.

Women also demonstrated high interest in vocational training areas, which are considered non-traditional for them, such as carpentry, plumbing and stove making. A variety of training methods were used and proven to be effective via the evaluation of the outcome of training cycles conducted. Dropout rate was low. Difficulties found were related to the high expenses of the training program in terms of required resources, equipment and expertise which are rarely found in remote areas.

In conclusion, such venture is a great opportunity for VET if it can be fully supported by the different rural and city councils.

Introduction

Sudan is the largest country in Africa with an area of 2.5 square million kilometres and 200 million feddn (1 feddn = 2400 meter) of good agricultural land and only 20 million feddn is actually utilized for agriculture. Sudan is composed of 26 states with 25 million people (1993 census) and growth rate of 2.8 %. There are many sugar cane, textiles and seed oil manufactures. Recently, the country is hoping to produce oil and enrich its economy.

In spite of its potentials, the country is facing major economic drawbacks which has greatly affected most of the formal and non formal sectors. Regarding the education sector, the government has set educational polices to ensure better human resource development. The educational policy conference held in 1992 recommended that general education be divided into two levels.

a) Basic education, starting at age six and going through grade eight.
b) Secondary education with multi-sections such as academic and vocational which is for a period of 3 years.

Due to the high literacy rate in the Sudan (59 % among males and 80 % among females) a Higher Council for Adult Education was established at the Ministry of Education in 1967. The adult education curriculum has undergone many revisions and changes to improve the attendance rate of the adult education classes.

Recently (two years ago) a pilot project was established in an intersectoral collaboration approach between the Ministry of education (MOE), Ministry of Labor (MOL) and the Ministry of Social Planning (MOSP) to eradicate illiteracy and equip adults with the skills needed to improve their standard of living. Therefore, the purpose of this paper is to highlight the above mentioned joint ventures which can be a great opportunity for Literacy and VET.

Theoretical Framework

The crucial importance of human resource development as a prerequisite for socioeconomic advancement is no longer a debatable matter, because as we all know, development which is ultimately for the welfare of the mankind, cannot be attained without the participation of trained human resources.

None the less, it is our impression that despite policy statement and elaborate planning, vital areas of human resource development are sometimes neglected. For example, it has become fashionable in some developing countries to emphasize high level manpower development to the neglect of the more fundamental vocational training. It is assumed that such mundane type of training will more or less take care of itself.

In the Sudan the public effort in the area of vocational training falls far short of the requirements of the development. Vocational training was taken to mean any systematic training which aims at providing the skill and knowledge required for employment in any trade or craft in any field of economic activity. It is usually carried out in a specialized training institution separate from the work place. It is in this last respect different form apprenticeship training.

On the other hand, adult education programs were meant to enable those illiterate adults who missed the opportunity for formal education to attain a level of basic literacy. Such programs were not appealing to many who were engaged in the labour market to earn living. With the advancement of technology and communication skills all over the world, it is a must that people be literate and have better training skills. Therefore, such pilot project can be a reality on a large scale basis to solve the problem of thousands of men and women in the Sudan in regard to literacy and VET. Moreover, other countries with similar situations can benefit from such a venture.

Procedures and Methods

A six month curriculum was developed by experts from MOE and MOL. The curriculum has emphasized literacy classes and various vocational training skills which might be different for men and women and for the different parts of the country depending on raw material available in each part. In the Sudan there are numerous adult education centers run by the MOE all over the country. The MOSP is running many Youth training centers in all parts of the country also. Both types of centers were selected as sites for the pilot project (about 30 centers). The MOL provides technical assistance in term of workshop equipment and trainers. The program is fully supported by the government with an assistance from the ILO/UNDP fund. The trainees are usually spending between 2 - 3 hours a day for 3 days a week with an average of 144 - 215 hours of instruction per course.

The curriculum for women has emphasized training in home economics, small scale industries such as shoe and leather making, food processing, and animal husbandry, maintenance of agricultural tools and electronics, carpentry, plumbing and store and soap making.

Findings and Conclusions

Both men and women have demonstrated high interest in the program indicated by the large number of attendees (100 % enrollment) and the low drop out rate which was less than 1 % in most centers compared to the normal adult education or youth training centers (enrollment is usually about 80 - 90 % but drop-out rate averages 30 - 50 %). Training methods were found to be effective and suit the need of different groups. Evaluation of the first cycle of the project has proven the success of such venture. The sale of the production from these centers can cover part of the expenses of running the centers. Moreover, the trainees themselves will have skills which will help them to earn a living afterwards.

Obstacles facing the program were related to the high expenses of establishing equipped centers and the presence of qualified trainers in the remote areas away from their families.

In conclusion, such a venture with support from the different states and provinces and with the effort of the people at the rural councils can be a reality and expand to include more areas and benefit more people.

Recommendations

1. It is important to involve the people themselves in the planning of the training program to ensure programs compatible with the need of the adults in each area.
2. Training can be divided into basic training for the beginners and upgrading training for those who have the basic skills.
3. After the expansion of the project, those training centers can be production units for some villages and communities which will enrich the market in those areas and neighbouring areas.

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New Designs for the Two-Year Institution of Higher Education: Implications for Vocational Education and Training[1]

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Abstract

Presentation addresses new designs for 21st century technical institutes and colleges, community colleges, and private proprietary institutions. Areas addressed include learning signature, outcomes, process, organization, partnerships, staffing, environment, celebration, and finance. Implications are presented for restructuring existing institutions and designing new institutions in terms of designing process, design specifications and exemplary new designs. Work is the result of national, two year project funded by the U.S. Department of Education through the National Center for Research in Vocational Education, University of California at Berkeley.

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[1] This paper draws from the work of the project, New Designs for the Two-Year Institution of Higher Education sponsored by the U.S. Department of Education through the National Center for Research in Vocational Education at the University of California-Berkeley. The project was co-directed by George H. Copa, Professor, Work, Community, and Family Education and William Ammentorp, Professor and Chair, Educational Policy and Administration, at the University of Minnesota, Twin-Cities Campus. William Ammentorp and George Copa are also Co-Directors of the Leadership Academy for Two-Year Institutions of Higher Education located at the University of Minnesota, Twin-Cities Campus. Bruce Jilk is an educational planner and architect with the Cunningham Group, Inc. located in Minneapolis, Minnesota. The paper was prepared for presentation at the joint annual conferences of The Union of Vocational Principal Association and the International Vocational Education and Training Association held in Helsinki, Finland on August 24-28, 1997.

The project was conducted at the University of Minnesota site of the Center located in the Department of Work, Community, and Family Education.

Introduction

On enter the 21st Century what should be the design of an up-to-date community or technical college/institute? What should the learning experience be like? How should the institution be organized? Who should be the staff and what should they be doing? What should the facility look like and how should it be furnished? And, how should the institution be financed so as to operate effectively? These are the questions addressed by New Designs for the Two-Year Institution of Higher Education (NDTYI).

The first products of NDTYI are a design process, design specifications, and exemplary new designs for continuing to improve community colleges, technical colleges, and private proprietary schools in the United States. These products form a package developed to assist an institution in continuing to improve, give its current design and local context.

Design Process

The **design process** provides a road map to follow in addressing design questions in an order that gets "first questions first" so as to retain focus on the local context of the institution, its uniqueness, and desired learning outcomes. The process also insures careful alignment of all major components of the institution in order to gain high quality and efficiency.

Design Specifications

The **design specifications** form a set of desired characteristics or features for each major component of an effective 21st Century two-year institution of higher education. They serve as a vision for what might be ideal, creating new "thinking space" for the design of an effective two-year institution of higher education and criteria for assessing the current state of an existing institution. In developing the design specifications, we proposed to start from "scratch" with few assumptions about what was needed and how needs should be met, always questioning conventional thinking and practice. The resulting design specifications are to serve as a way to stretch thinking and stimulate responsible critique of current practice.

New Designs

The **exemplary new designs** serve as a way of clearly describing the design specifications "in practice". The exemplary new designs were selected to concretely illustrate what NDTYI has in mind and to provide "benchmarks" for reviewing current institutional operation. For some phases of the design process, we developed actual new designs for institutional practice. For other design process phases, the project used a different route--identifying and describing actual institutional practices that met some of the proposed design specifications.

Project Results

What follows is a brief sketch of new designs for two-year institutions of higher education. The sketch is organized by the phases in the design process. For each phase, a brief explanation is provided along with either a section of the design specifications or an exemplary new design. This tact was taken because, even with limited space we wanted to give a comprehensive view of the NDTYI products. The final project report to be available right after the start of the new year is much detailed and complete.

The design process was made up of ten elements, executed in a particular order, referred to as "designing-down". The design process is shown in Exhibit 1. The elements were addressed in a particular order so as to get careful alignment among the elements and to get "first questions first". The idea is to ensure that the design fits the needs of the situation and proceeds in a logical order from aims to actions to supporting structure, culture, and environment.

Learning Context

Each design for a two-year institution of higher education must meet the needs of a particular context or situation. The context is described in terms of problems with current institutional operation, opportunities to be taken advantage of with a new institution, and goals to be accomplished by the new institution. One of the key assumptions relating to the emerging importance of synergy which was used as a foundation for the design process is shown in Exhibit 2. Studying and analyzing the learning context results in a set of design criteria for use to guide and monitor the accomplishments of the other design process elements. The design criteria used as a bases for NDTYI are shown in Exhibit 3.

Learning Signature
Learning enterprise designs are given direction and energy by the symbols and metaphors representing the hopes and expectations of policy makers, educators, and their students. An effective design process must first try to elicit and understand these hopes and expectations as a way to give coherence and focus to learning design. Often the signature takes form through symbols and metaphors (i.e., words, pictures, people, stories, objects) representing a deeply shared perspective on the learning enterprise. An exemplary new design for learning signature is show in Exhibit 4--a promise and expectation set out all through the campus of Kirkwood Community College in Cedar Rapids, Iowa.

Learning Outcomes
Globalization and its associate complexity demand that two-year institutions of higher education have a clear idea of the value to be added by the learning enterprise as a starting point for program improvement. In short, two-year institution leaders must clearly know the competencies, standards, or results they want to produce for and through the learners. At the same time, students must be able to see what two-year institutions can do for them in terms of their personal development. An exemplary new designs for learning outcomes is shown in Exhibit 5 which has been used by the Torrens Valley Institute of Technical and Further Education for the past few years in Adelaide, South Australia.

Learning Process
Learning outcomes are accomplished through the design of an appropriate learning process, traditionally viewed in terms of the language of curriculum, instruction, and assessment. Too often in higher education, the attention is to teaching in contrast to learning and to subject matter (curriculum) at the expense of instruction and assessment. Most faculty in higher education are not required to study the learning process -- instead they center almost solely on subject matter. If two-year institutions are to address the learning design challenges and opportunities of the future, they must have a working language and knowledge of the learning process with foundations in adult development. One of a four part set of design specifications for the learning process developed by NDTYI is shown in Exhibit 6.

Learning Organization
For the learning process to be successful in reaching the learning outcomes in a manner called for by the learning signature, a learning infrastructure or organization must be put into place and continually improved. The learning infrastructure is made up of the organization of learners, learning

time, learning settings, subject matter, staff, technology and learning environment. It is here that new designs for two-year institutions are most clearly visible. Familiar physical and organizational forms of higher education are unlikely to be responsive to the needs of students and the changing nature of society and its lifeplaces (e.g., work, family, community). Exhibit 7 shows an exemplary new design for organization of learning settings--one of 450 satellite learning centers making up the San Diego Community College.

Learning Partnerships

The link between higher education institutions and their communities takes the form of learning partnerships among public and private sector organizations. Two-year institutions can no longer "go it alone"; they have neither the resources nor the knowledge to be set apart from their surroundings. Instead of the "ivory tower" of the past, higher education institutions of the future will be ever more closely integrated with their communities and will bear increasing responsibilities for the quality of life of those who support and benefit from its work. Exhibit 8 shows an exemplary learning partnership at Red Rocks Community College in Lakewood, Colorado between OSHA, the College, and Trinidad State Junior College and in providing a national training center for OSHA policies and procedures.

Learning Staff and Staff Development

The changed perspective suggested above mandates parallel development of teachers, administrators, and support personnel ready to adapt two-year institutions to new realities. Higher education will need to identify, train, and support leaders who can shape curricula and student experience in forms indicated by ever-changing learning expectations and processes. The staff must include all those involved with the partnerships of the institution. Exhibit 9 presents the design specifications for the staff developed as a part of NDTYI and following on the design specifications for previous elements in the design process. Exhibit 10 shows the cover of the curricular guide for an exemplary new design for staff development at Miami-Dade Community College.

Learning Environment

The driving force for higher education has shifted from the traditional - static - subject matters to a dynamic view of knowledge and its use. Information technology has been and will continue to be a pivotal force in this development; it has redefined the process of knowledge creation, transmission, and application. Learning technology has become one of the major considerations in any new design for the learning environment for two-year institutions of higher education. After consideration of the design elements noted above, attention shifts to the physical and social environment of the institution. New designs will not be constrained by architectural forms nor will they be limited to traditional educational practices; they will be motivated by the dynamic integration of higher education institutions with their students and communities. Learning environments will include consideration of settings such as home, workplace, community, and campus. Exhibit 11 shows a framework for the learning environment proposed by NDTYI which provides for the individual learner, a learning work group, the learning enterprise, a federation of learning enterprises, and a world-wide learning network.

Learning Celebration

The New Designs process is integrated by the cultural symbols and practices of all those associated with the two-year institution of higher education. Learning experiences and their applications should be continually reinforced through celebrations whereby the community confirms the relevance of the work of higher education. Exhibit 12 shows some of the design specifications for learning celebration formed by NDTYI.

Learning Finance

This element of the New Designs process concerns both the costs and revenues for higher education. Key strategies concerning cost include cost containment, improved efficiency, re-engineering, and external sources of services. On the revenue side, strategies include institutional development, new products and services, partnerships, and new markets.

While the elements of the design process are presented in linear, downward order, the process also involves moving upward and among the elements to ensure close alignment and internal consistency and coherence. Close alignment of the elements is needed to realize quality and efficiency in operation of the two-year institution of higher education.

Educational Transformation

The implications of new designs for the two-year institution for educational transformation are made clear by contrasting the characteristics of an existing institution (or whole system) with the design specification resulting from the new designs project (see Exhibit 13). The transformation could be accomplished by first prioritizing the elements of the design process to identify where to start the transformation (i.e., learning outcomes, learning staff) and then finding benchmark institutions to study and emulated in making the needed transformation (see Exhibit 14).

Project Focus

The work of the project was focused in two different ways--by type of institution and by motivation for considering new designs. First, the project focused, only on two-year institutions of higher educational and not four-year colleges and universities. Two-year institutions included technical institutes and colleges, community colleges, and private proprietary school. Two-year institutions offer a wide variety of programs culminating in certificates, diplomas and associate degrees. In the United States, there are approximately 1200 public technical institutes and colleges and community colleges and some 3000 private proprietary schools.

The project also focused on a particular target audience in terms of motivations for considering major changes in the above mentioned institutions. Three specific groups were of interest: (1) administrative leaders responsible for designing entirely new institutions (e.g., the Homestead campus of Miami-Dade Community College in Florida which was destroyed by a hurricane, the two new campuses to be built by the Maricopa Community College District in Phoenix, Arizona), (2) administrative leadership responsible for major restructuring (merger, re-engineering, downsizing) of institutions (e.g., merger of technical and community colleges in Minnesota and Connecticut), and (3) policy makers at the local, state, and federal levels responsible for policy, regulations, and funding two-year institutions of higher education. Care was taken in the project development and operation to involve these target groups and ensure they are a part of reporting and dissemination plans.

Project Process

The design process is envisioned as being like a seminar where knowledge and experiences are shared among a design group with the purpose of mutually learning their way into new designs for a higher education institution that meet the needs of the context they have at-hand. The knowledge and experience includes that possessed by the group itself as well as what can be brought to the groups from others. In New Designs for the Two-Year Institution of Higher Education, several sources of information served as ingredients to the design process.

Best Professional Practice

Care was taken to scan nationally and internationally to identify the best professional practices in two-year institutions of higher education. We looked for the effective and innovative places, leadership, and concepts for possible use in developing New Designs specifications for each of the elements of the design as described above. At each design element, we also looked to professional practices outside of public higher education for ways that could improve the design process and specifications.

Latest Research

We also searched for the latest research on higher education relating to each of the design components. As with the scan for best practice, we also search for ideas and concepts from outside of higher education that might prove worthy of adaptation. We particularly examined the past and present research and development work of the National Center for Research in Vocational Education for study findings and recommendations that were appropriate to include in New Designs specifications.

Reform Reports

We examined several of the reports advocating revision and reform of two-year institutions for recommendations and supporting rationale that deserved consideration in the design process. We wanted to insure that we were making use of previous studies and planning of two-year institutions and were not merely reinventing what had already been reported. Sometimes these reports addressed only a certain element of design process--our contribution was unique in addressing the full range of elements and striving for alignment in the recommendations among all of the elements.

Focus Groups

Group interviews were used in the design process in order to get first hand views of many of the design elements. Interviews were held with groups of students, faculty, administrators, and external institutional partners. The group interviews held for each of the selected design elements were as follows:

- Learning Outcomes--
  - San Diego Community Colleges, San Diego, California, students
- Learning Process--
  - Red Rocks Community College, Denver, Colorado, administrators
- Learning Organization--
  - DeKalb Community College, Atlanta, Georgia, faculty
- Learning Partnerships--
  - Miami-Dade Community College, Miami, Florida, external partners
- Learning Staff and Staff Development
  - Miami-Dade Community College, Miami, Florida, faculty

Each of the group interviews was tape recorded, transcribed, and analyzed for implications for the design specifications and discussion by the National Design Group.

National Design Group
The national design group was selected to give broad representation of leadership and stakeholders in the future of two-year institutions of higher education. They were also selected to give diverse perspectives in terms of gender, ethnicity, and geographic location. The members were: Jacquelyn Belcher, President DeKalb College, Decatur, Georgia and 1996 Chair of the American Association of Community Colleges; Paul Cole, Secretary Treasurer of the State of New York AFL-CIO; James Frasier, educational research Motorola; Augustine Gallego, Chancellor San Diego Community College and Chair-Elect of the American Association of Community Colleges; Dorothy Horrell, President of Red Rocks Community College; Bruce Jilk, educational planner and vice president for Hammel, Greene and Abrahamson, Inc.; Robert McCabe, Senior Fellow League for Innovation in the Community Colleges and former president of Miami-Dade Community College; Sally Novetzke, community representative Cedar Rapids, Iowa; and Ruth Silverthorne, faculty and counselling Skagit Community College, Mt. Vernon, Washington. Some of the National Design Group are shown in Exhibit 15.

Project Staff

The team from the University of Minnesota that lead New Designs are: George H. Copa and William Ammentorp co-directors and professors of Work, Community, and Family Education and Educational Policy and Administration, respectively, in the College of Education and Human Development and Sandra Krebsbach a Ph.D. candidate in Educational Policy and Administration served as coordinator.

Future Plans

New Designs will move into the dissemination and implementation phase. The final report will be available through NCRVE in 1997. A full report and executive summary will be available. During 1997, New Designs will be providing training and technical assistance and selecting and describing additional exemplary new designs from across the country. If you wish to contact New Designs for the Two-Year Institution, please call (612) 624-1740. New Designs mailing address is: New Designs for the Two-Year

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Restructuring Vocational Education and Training in Swaziland

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Abstract

Vocational education and training in Swaziland is at the crossroads as it faces problems in respect of: 1) Relevance; 2) Standards; 3) Comparability; 4) Accessibility; and 5) Skilled workforce. These factors have been found to be inadequate for the development of the necessary competencies in students and the workforce for productive life. Subsequently, the delivery of vocational education and training is undergoing restructuring. In this paper selected studies are examined to identify the socioeconomic pressures for change. Finally, twelve principles were derived from the selected studies to constitute the framework for reconstructing vocational education and training.

Introduction

As we approach the millennium, the world of work looks different than it did a few decades. It is changing and will continue to change. This has resulted in a recrafting of the workplace to transform the manner people work. Employees are now more likely to be required to perform tasks with high levels of complexity and social interactions, but less likely to require fine motor skills. Such complexity tasks are associated with higher levels of vocational education and training. Therefore, employees need to plan their careers strategically. Organizational restructuring and right sizing are current buzzwords in the workplace. There is little confidence about the longevity of employment and considerable opportunity for people to advance within organizations.

Pressures for change in the vocational education and training sector in Swaziland have been mounting. The pressure is to provide further education and training opportunities for the tens of thousands of school leavers as well as retraining the existing workforce who need basic vocational and technical skills required by Swaziland's economy for either formal or informal employment/re-employment (Educansult, Limited, 1992). This vocational education and training should make available to potential investors skilled workers, and also create the opportunity for entrepreneurship and the sustainability of self-employment. In Swaziland, such a workforce can be better prepared within the context of an integrated systems development in vocational education and training (Frey, 1996).

Purpose

The purpose of the paper was to review, synthesize, and present selected relevant studies that have influenced the restructuring of vocational education and training in Swaziland. For purposes of this review, focus will be on the most recent and prevalent studies currently used to reconstruct the delivery of vocational education and training. The research questions for which answers were sought included:

1) In relation to the delivery of vocational education and training in Swaziland, what are the socioeconomic pressures for change?

2) With the restructuring of vocational education and training in Swaziland underway subsequent to the socioeconomic pressures, what principles have been derived to undergird the change process?

This study was conducted using documentary and/or information research methodology (Asselin & Finch, 1988). This methodology brings relevant information bases and other sources to bear on an area of focus. The criterion for inclusion of studies in this review was the impact they have made on, and the direction they have given in, restructuring vocational education and training. As a result, the selected studies determined to meet this requirement were: (1) System Development in Vocational Education and Training in the Kingdom of Swaziland,; (2) Project Preparation Study Kingdom of Swaziland; and (3) National Education and Training Standards in Swaziland. In this paper, each of these studies is briefly described. To answer research question one, socioeconomic issues and concerns were identified in each of the three studies reviewed. To answer research question two, the studies reviewed were synthesized to determine tenets or principles that could be derived from the review process. These principles were perceived to undergird and direct the restructuring of vocational education and training to constitute the framework for the new paradigm of vocational education and training in Swaziland.

I. *System Development in Vocational Education and Training in the Kingdom of Swaziland*

The German-Swazi-Cooperation proposal in the area of vocational training is aimed at the development of company based and driven skills and attitudes in vocational training system for the Kingdom of Swaziland (Frey, 1996). This followed a Memorandum of Understanding (November 3rd, 1995) by the Ministry of Education of the Kingdom of Swaziland, the Embassy of the Federal Republic of Germany, and the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). The proposed system development in vocational education and training is a complex task and process that entails mainly educational, economic and social policy. The system reflects the results of combined interests of political, economic and social groups involved in training. Depending on the culture and the economic structure, the system development in vocational education and training can be public or private driven in terms of financial support, or can be school based, company based, or dual. The dual system would combine the two learning environments of the school and company "as a variant of company based training" (Frey, 1996). In-company training means dual use of existing industrial know-how and equipment (Frey, 1996). As Frey puts it "the most appropriate form of training would appear to be one which makes full use of already existing in-company training potentials. The German-Swazi Cooperation proposal is to start the development of a company based and driven system of vocational training in the Kingdom of Swaziland.

Some of the problems and issues associated with the pressures for restructuring vocational education and training in Swaziland are (Frey, 1996): 1) Problems of unemployment as well as of regional and social disparities together with structural changes in the economy and society; 2) The tightened dictate of up-coming open market competition in the region; 3) Unaffordability of high public cost of financing a school based system of vocational education for the majority of youth; 4) Low efficiency, very limited capacity, and insufficient linkages to the world of work of school based vocational education; 5) Lack of quality and flexibility of training in the current paradigm as well as internal and external efficiencies; 6) Lack of vocational guidance; 7) Lack of competence of the labour force in relation to international comparable standards; and 8) Inadequate integrative learning capacity and direct linkages to practice and employment.

II. Project Preparation Study

Recognizing that providing an effective and relevant educational system to meet the needs of citizens and support economic growth is a critical component of national development, the Ministry of Education of the Kingdom of Swaziland engaged the services of a Canadian based consulting firm to study the education sector. Educansult Limited, the Canadian based Consulting firm was awarded a contract to review all educational levels with a particular focus on strengthening vocational [pre-vocational] training [education] at the secondary schools (Educansult Limited, 1992).

The Project Preparation Study consisted of three phases, namely,. Project Conceptualization, Project Preparation and Detailed Preparation. The African Development Bank (ADB) funded the project as a feasibility study between 1989 and 1992. Subsequently, the project was determined to have great economic potential hence it was approved and indeed the project is now underway with the financial assistance of the ADB.

Some selected issues and pressures identified by Educansult Limited (1992) that contributed to socioeconomic pressures to vocationalize the secondary curriculum of practical studies were as follows: (1) Demographics (High population growth rate in the country and hence within the school system); (2) Manpower development (Discrepancy between employment opportunities and the number of school leavers); (3) Graduate outputs and system efficiency (High repeat and drop-out rates); (4) Enrollments (Most students enrolled at the secondary level can not proceed through to tertiary education).

III. National Education and Training Standards

Change normally occurs as a result of some kind of pressures on an organization or country. Pressure had been mounting in the education and training sector in Swaziland that led the Ministry of Enterprise and Employment (formerly Ministry of Labour and Public Service) to approach the Swaziland Training and Industrial Development Project (STRIDE) for assistance. The STRIDE Project was a USAID/SWAZI Cooperation for Swaziland manpower development funded by the United States Agency For International Development (USAID). Specifically, the initiating concerns expressed to STRIDE by the Ministry of Enterprise and Employment was about the "Standards" of training provided by education and training providers in the private and public sectors, and the comparability of qualifications issued by these two sectors. Subsequently, STRIDE engaged a researcher/consultant, Professor Ian Bellis of the Rand Afrikaans University, South Africa to undertake a participative investigatory project with as wide a presentation of stakeholders and role players as possible (Bellis, 1996).

Long individual interviews and focus group interview meetings were conducted by the researcher/consultant with various purposively sampled stakeholder groups. The sampled stakeholder groups in the private and public sectors sent representatives to constitute the participative working groups in the three Conferences that were subsequently conducted. The stakeholder groups/organizations from which the working groups were drawn consisted of: (1) Ministry of Education (32); 2) Training Institutions (University, Teachers Colleges, Proprietaries) (30); 3) Employers (Business and Industry) (10); 4) Labour Unions (6); 5) Ministry of Enterprise and Employment (5); 6) Directorate of Industrial and Vocational Training (3); and 7) Ministry of Economic Planning and Development (Bellis, 1996).

These focus groups expressed a wide range of pressures toward change in the education and training sector. The pressure came from the issue of quality as related to the notion of standards. The notion of quality of standards was identified as having the following dimensions or facets (Bellis, 1996) : 1) Quality of the standards of the learning process; 2) Quality of outcome standards; 3) Quality in the nature of assessment; 4) Quality as related to the standard of capability, of professionalism of the individual teachers and trainers of the providing institutions; 5) Quality as related to the standard of the content of education and training courses; and 6) Quality as it pertains to the issue of comparability of standards across various providers of education and training in Swaziland, in the region, and internationally.

Development of the Principles of Vocational Education and Training

In this paper an attempt was made to determine the socioeconomic pressures for change in the vocational education and training sector in Swaziland. Further, principles to undergird the change process were highlighted as a basis for policy formulation of System Development in Vocational Education and Training in Swaziland. The three studies reviewed in this paper, namely, 1) System Development in Vocational Education and Training; 2) Project Preparation Study; and 3) National Education and Training Standards, have logically led to the development and formulation of the statement of principles to guide the process of system development in vocational education and training in Swaziland. These principles are well expressed and articulated by Bellis (1996, pp. 38-41).

Integration

Education and training should form part of a system of human resources development which provides for the establishment of an integrated approach to education and training which is expressed in terms of nationally acceptable qualifications.

Relevance
Education and training should be and remain relevant to national development needs; industry and service sector needs; regional, local and community needs; individual development needs and needs relating to the advancement of knowledge, science and technology.

Credibility
Education and training should have international credibility and credibility for industry and service sectors, providers and learners in its ability to achieve the nationally agreed aims for education and training. These aims should be consistent with economic and social development priorities.

Coherence and Flexibility
Education and training should adhere to a coherent framework of principles and certification which may be established at national level but should permit the flexibility of interpretation required to meet the needs of industry and service sectors, providers and learners.

Standards
Standards for education and training should be expressed in terms of nationally agreed framework and nationally and internationally accepted outcomes.

Legitimacy
Education and training should provide for the participation in planning and coordination thereof of all significant stakeholders to ensure transparency.

Access
Access to appropriate levels of education and training should be provided for all prospective learners in a manner which facilitates progression.

Articulation
Education and training should provide for learners on successful completion of accredited prerequisites to move between components of the delivery system.

Progression
Education and training should ensure that the framework of qualification permits individuals to progress through the levels of national qualifica-

tions via different appropriate combinations of the components of the delivery system.

Portability
Education and training should provide for learners to transfer their credits or qualifications from one learning institution and/or employer to another.

Recognition of Prior Learning
Education and training should through assessment give credit to prior learning obtained through formal, non-formal and informal learning and/or experience.

Guidance of Learners
Education and training should provide for the guidance of learners by persons who meet nationally recognized standards for educators and trainers."

Conclusions and Implications

A system may be defined as elements or components in interaction. In this paper a vocational education and training System for Swaziland was considered. The System would be reconstructed on the twelve principles highlighted. The principles were derived from the analysis and synthesis of the socioeconomic pressures identified as issues, concerns, and problems expressed by various stake holder groups and interest groups, not to exclude professionals in Swaziland The twelve principles developed here can undergird a national policy of a System Development in Vocational Education and Training for Swaziland. In the opinion of Bellis (1996), "the statement of principles included here are those which have been adopted in South Africa"(p.38). He further states that, there appears to be merit in the Southern Africa Development Community (SADC) countries in moving towards a common understanding of both issues at stake and the principles on which development may take place. These principles are offered as a basis in that regard.

These principles are a clear indication of deliberate efforts to provide an efficient, targeted and integrated vocational education and training system. Swaziland is at a watershed in her socioeconomic history. The global market will create further pressures for better quality and most competitive products and services. Extensive high quality vocational education and training systems of delivery are essential if enduring widespread success in global market is to be achieved. The restructuring of vocational education and training in Swaziland will demand much of educators and trainers, labour unions and also impact strategic planning and management.

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Student Learning in Vocational Education - An Epistemological Problem?

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Abstract

The purpose of this paper is to give a few points of departure of the problem of studying how students in initial vocational education and training develop and make use of their knowledge, skills and competences for industrial work. In this paper I focus on the problem of epistemological background of the planning of vocational education and the relation between core subjects and subjects specific to a programme. I will also discuss whether oral examination is an alternative way of assessment of students' competences.

Introduction

The students - particularly in the municipal school - have low grades and often special educational experience from secondary school, thus my interest in approaching learning problems from the fields of both special and vocational education. The structure of both initial and further vocational education and training, as it finds expression in authoritative documents, takes its point of departure in the processes of industrial work. The question I want to raise - and as I consider as equally important - is, whether the education and training of these competences is also established knowledge of the research of learning theories and developmental psychology - that is, in the cognitive structure of individual students. This is both an exciting and problematic intersection of the problem of the planning, implementation and evaluation of vocational education and training. After examining Swedish curricula for industrial vocational education and training, I have arrived to the conclusion that these epistemological perspectives of student learning and development are often neglected in most of these documents.

Should the structure of the work processes in the industry be transferred to and constitute a model for vocational education and training? Of course, the vocational students must become familiar with industrial work but the question is whether the model of work processes also creates the best model for learning problematic phenomena and grasping the idea of industrial work in vocational education and training? It may be that "the model of industrial processes" is in conjunction with the general idea of teaching strategies but not with the students' cognitive structures and learning conditions (c.f. Novak 1977).

There is a growing body of research concerning the quite rapid development of the new industrial processes and the demands on new knowledge, skills and competences. The research reports in this field, however, has it's focus more on what to learn, or rather how to organize the education, and less on how to learn. We have a very limited knowledge of how students in industrial vocational programs conceptualize and *learn* technical (and other) phenomena as well as how they regard industrial work and their conceptions of future work.

In this paper I concentrate my interest on how students experience concepts and competences within workshops as learning contexts.

Work Processes and Cognitive Structure

In the figure below my intention is to show how I conceptualize the problem of the relation between the individual's cognitive abilities and the working processes as a base for learning, developing and utilizing (core) competences. The structuring of the figure has its origins in the evaluation model developed by Fischbein (1986). The focus is on how the different competences are developed and used in industrial education.

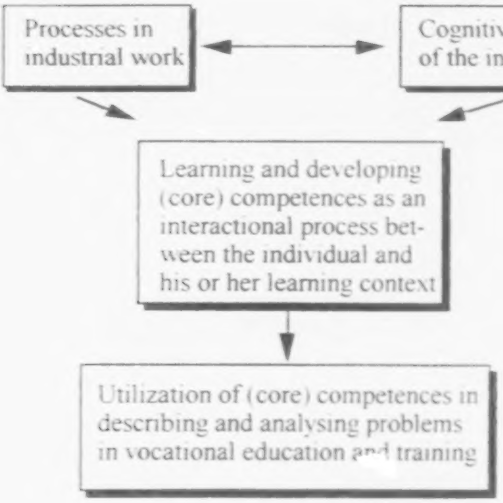
Processes in industrial work
Cognitive structure of the individual
Learning and developing (core) competences as an interactional process between the individual and his or her learning context
Utilization of (core) competences in describing and analysing problems in vocational education and training

Figure 1. *The Relation between the Individual's Cognitive Abilities and the Working Processes as a Base for Learning, Developing and Utilizing (Core) Competences*

In a present study I will investigate - theoretically and empirically - how the students' competences are developed in industrial vocational education. Theoretically, the study is rooted in cognitive science with emphasis on cognitive psychology, developmental psychology and learning theory and the relation to the disciplines of industrial sociology and work psychology. Empirically, the study is oriented towards students in initial vocational education and training in municipal and industrial upper secondary schools. The focus is both on what kind of competences students develop and how they perform the new competences that are supposed to be a result of the industrial education in Sweden, according to different authoritative documents. The problems and questions that I will approach are: What kind of knowledge, skills and competences are in accordance with new designs of work? What kind of competences are acquired and under what conditions? What kind of competences are learned in different contexts such as municipal or industrial upper secondary education? What are the relations between "specific skills" and "general competence" in a specific domain? Are there transfer processes between these skills and different contexts? Another question I want to raise in this paper is whether oral examination, as an assessment method, can reflect the problems and questions mentioned above?

The Structure of Vocational Education

In Sweden - as in many industrialized countries - one can notice an intensifying debate about the problem of how to organize the vocational education and training (VET). Broadly speaking, there are three models occurring in this debate among representatives from both the educational and the labour market sectors. Basically it has to do with the question of whether the initial vocational education shall be a responsibility of the upper secondary school, the industrial life or a mixture of these organizational solutions to the problem. Sweden, Norway and France have chosen the first model; the Anglo-Saxon countries the second model; and the German-speaking countries the third model. This last model also includes a major moment of apprenticeship period. In the international debate it is quite common to refer to the German solution especially when the different contributors interpret the success of the German economy (Reich, 1993; Thurow, 1991; c.f. Young, 1993). Different countries try to find different solutions but there is also a drift towards a "European model"- notably the German model. One important background is the question of how the American and the European economies develop.

One basic question that occurs is if there exits any research based knowledge that can shed light over this problematic topic. A huge part of the knowledge about industrial life and its relation to education emanates from the discipline of industrial and educational sociology. Thus my interest of studying learning in different industrial educational environments and to include cognitive learning at an individual level.

Learning Competences

When Goldman (1986) discusses "epistemology as a multidisciplinary affair", he divides the concept into two parts: individual and social epistemology.

Cognitive science tries to delineate the architecture of the human mind-brain, and an understanding of this architecture is essential for primary epistemology. Social epistemology needs help from various of the social sciences and humanities, which jointly provide models, facts, and insights into social systems of science, learning, and culture (op cit, p 1).

There are three things to consider: first, what kind of competences do the students learn and develop; second, how are these "new competences" trained; third, how do the students use their competences when they try to explain problematic phenomena in the process of education? One major problem is to compare the student competences - as expressed in different contexts - to the scientific community and what is stated in different governing documents. I do not want to reduce these problems to only a technical and/or physical nature, rather I will emphasize that these problems are of a formal nature and that the students do not get formal education in i.e. physics even if some of them might receive (individual) tutoring of these problems (c.f. Liljefelt, 1993).

The competences are also intended to be general rather than specific (c.f different international curricula). I will describe these competences by asking, what characterizes these and why they are appearing in the governing documents today. The question is whether this conception of competences suits vocationally oriented programmes as good as academically oriented programmes - if this distinction is possible and desirable? This problem can be analysed on both an individual and a societal level. There is also a shift from more specific skills to general and transversal competences. At the same time these documents hold a very traditional position when encountering severe difficulties in describing the relation between theoretical and practical knowledge. This is even more problematic when viewing the question from vocational praxis.

It is difficult to differentiate between vocational and academic studies. This distinction is a construction at the administrative level for the planning and implementation of the curricula and with its roots in models of traditional working life. Both vocational and academical programs consist of a combination of theory and practice. Even the learning situation is - in its structure and content - based on this combination of theoretical and practical knowledge. But, how this theoretical and empirical problem is manifested in various learning settings is still a matter for scientific research.

The problem of the teachers' planning and performance of the teaching is not a prime target for my interest in this paper. However, I hold the position that the vocational teachers often perform their teaching on a theoretical level. Why is that? In some of the vocationally oriented programs one can find a large number of students with learning problems - or students that the schools have difficulties to cope with.

This is also an important background why I can view these problems as a matter for both special and vocational education. When the teacher is about to meet and explain problematic features for students with cognitive problems, he or she, quite frequently use analogies or metaphors, which in itself require that the teacher will be forced to work on a high abstract level. Whether this means that the teacher rely on theories accepted by the scientific community, formulate personal naive theories of i.e. physical problems from which they deduce answers to those problems or if the problem solution is subjectively experienced as the result of a mental enactment of the situation, could be subject of an interesting study. How the vocational students conceptualize different phenomena, can be studied in close connection with the scientific approach which pays attention to similarities and differences between "naive" and "expert" learners and "untutored" and "tutored" learners. The huge body of research, concerning these problems, is strongly related to the problem of how students conceptualize physical phenomena. Some of the major contributors represent the discipline of philosophy of science (Dreyfuss & Dreyfuss, 1986; Yates et al., 1988). That gives these theoretical and empirical problems a position both related to learning theories and developmental psychology and research within the perspectives and traditions of both special education and vocational education.

In my earlier work (Liljefelt, 1993) I reviewed the literature of the Cognitive science field, related to vocational education. My theoretical and empirical interest in that study was directed towards the interaction between students and teachers in motor mechanical education in upper secondary school. I was particularly interested in the (possible) distinction between the conceptions of "to do" and "to understand". The greater part of the teachers planning and performance as well as the evaluation of teaching as related to the concept of "to do" while many students were occupied with the concept of "to understand" (c.f. Dewey, 1996).

In a later work I will discuss these concepts in relation both to the field of didactics and the purpose of this work. I consider the relations between on the one hand, the concepts of "to do" and "to understand" and, on the other hand the concepts and questions "what", "how" and "why", which take a central position in didactic studies, as a problematic matter.

New Competences in Swedish Upper Secondary School

In an analysis of the authoritative documents (Carlsson & Liljefelt, 1994) that works as governing documents for the planning of both academic and vocational education and training in Swedish upper secondary schools and the industrial schools (The Industrial Programme), four aspects of competences could be identified:

1 Knowledge of vocational subjects
2 Ability to solve problems
3 Self confidence
4 Craftsmanship

These competences can also be identified in all other programmes in the Swedish upper secondary education. How is knowledge, skills and competences treated in the literature; how are they related to learning theories and; what are conditions for individual development according to developmental psychology; and what are the epistemological perspectives on these concepts and their mutual relation? In the final discussion of my empirical findings I am going to examine how these three concepts are related to and treated in the governing documents for industrial education.

Knowledge, skills and competences cannot be viewed exclusively as something a person learn by experience - e.g. in school contexts. This is an epistemological problem that must be dealt with in this study. Knowledge is - probably - both inherited and developed in learning contexts. Skills are obviously learned - as a declarative knowledge - but its epistemological origins could be hard to explain. Competences - both general and specific - which I regard as a product of knowledge and skills - are learned but its relation to how individuals "receive" knowledge and how this is related to skills must be described and explained.

Design of Work, Epistemology and Learning

The vocational students are individually undertaking a study programme, but they are also members of a group, they share a lot of experiences, not only learning activities, with their school-mates. At the same time they experience and influence the environment - the learning context.

Both Jean Piaget and L. S. Vygotsky were interested in human learning and development but they regarded this process from two different perspectives. According to Piaget learning and development was a process initiated by the individual towards her environment, whereas Vygotsky holds the opposite position, learning and development grow as a consequence of the environmental influences imposed upon the individual.

Bidell (1988), who wants to formulate a "dialectical approach" to the interrelationship and change according to Piagetian and Vygotskian theories, gives the following description of this distinction:

> *In the standard version of the debate, Piaget is a hierarchial stage theorist intent on individual development and Vygotsky is the champion of the social context of human development. While these positions reflect real and irreducible characteristics of the two theories, the 'two camps' view of the situation is increasingly dissatisfying to psychologists familiar with the many points of agreement and similarities of approach found in the two theories. This is especially true for the growing number of researchers interested in understanding the relationships between the social and cognitive aspects of developmental processes* (op cit, p 329).

The author continues to discuss the recent history of developmental psychology by pointing at

The dichotomies of continuous versus stage models, structural versus functional interpretations, procedural versus declarative knowledge, domain-specific versus universal approaches, and vying metaphors, have led to increasing interest in finding ways to integrate various descriptions (op cit, p 330).

At the same time, it exists a biological critique of human developmental theory - in its more extreme shape these critics deny the possibility of individual cognitive development - as a matter of fact they deny the very existence of developmental psychology, people do not learn - (almost) everything is innate (c.f. the concept of the learning paradox).

For those who are interested in these questions I would like to refer to a discussion between Jean Piaget, Noam Chomsky, Stephen Toulmin and others at a conference in Paris in which these problems were under debate (Piatelli-Palmarini, 1981).

Design of the Oral Examinations

In this connection, there exists particular methodological problems. Even if there is a huge body of research concerning teaching and learning these methods have been developed for studies of academic subjects and in the contexts of class-room processes. Since quite recently one can observe a growing interest among researchers working in the field of vocational education to develop and scientifically test methods to observe the interaction and the teaching which occurs in for example, workshops. The students that participated in both of this study - 93 boys and 11 girls were undertaking their education at eleven schools in Sweden.

The design of the test was performed as an individual examination. We have chosen the term "experimental interventional situation". The students had to give an oral explanation of the manufacturing process of a detail selected by the vocational teachers and described as difficult to produce. The detail also met the criteria for performing the four competences mentioned above. The detail was not "perfect" - there were a lot of possibilities for the students to comment upon this matter.

The oral examinations took place at the end of the vocational programme. A colleague of mine and I placed the detail on a table and asked the participants if they could give an oral description of the manufacturing process. The students were not provided with any aid as a drawing of the detail. Another restriction was that they should managed with conventional machines - no computer-aided machines or NC-machines. After the two examinations we collected the students grades in "Swedish", "Mathematics" and "Work shop skills" - note that this information was not familiar to us before the examination situations.

There are several interesting questions to be raised in relation to the out-come of this study. One thing is the observed differences between "the Grades" and the performance of the "Oral examination" of every single student. This is the basic out-come of the study. But the results also can be of interest when you try to relate the different subjects to the different competences.

Discussion

One assumption of the general idea behind the construction of mixing core subjects to subjects specific to a study programme is that it will facilitate the learning of problematic content and phenomena in the vocationally oriented programmes. As the results indicate, there are interesting relations between Subjects and Competences. This problem is subject to an analysis which will be presented later this year.

Even if one must be careful and treat the results on a tentative level, it is my intention that the discussion can focus on the feasible ways to relate the out-come - the utilization of competences and its relation to some subjects - to theories of learning and development.

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Students' Motives for Making Study Choices with Increased Freedom in Constructing Their Study Programs

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Abstract

In Finland the organization of post-compulsory education, vocational as well as general/academic, traditionally comes close to a strictly structured model. However, from the beginning of the 1990's, there has been some movement towards more open study program structures. Firstly, it entails deregulation and decentralization of the educational system. Secondly, underlying idea is the individualization of education by increasing students' freedom in constructing their study programs. This type of flexibility is what the experimental reform of upper secondary education was aimed since 1992.

Individual freedom of choice may be regarded valuable in itself as well as a means, for example, for improving study motivation. However, the maturity of young students to make decisions on their study choices has been questioned and, for instance, students' motives behind choosing courses have been suspected less rational.

The paper addresses the problem of students' motives in constructing their study programs with increased flexibility created by the experimental reform of upper secondary education. First, some basic features of the reform are outlined and then some results of a questionnaire study on students' motives (N = 2 627) are reported and discussed.

1. Introduction

When planning and offering study programs of post-compulsory education, vocational as well as general/academic, it is possible to follow various principles. On the one hand, strictly structured courses of studies, aimed at specified vocational or academic wholeness of qualification, are planned and offered for students (aiming, possibly at similarly predetermined options in working life or tertiary education). On the other hand, post-compulsory education might consist of separate pieces of studies without any pre-planned structure, content, length, end or destination qualification.

In Finland, the organization of post-compulsory vocational and academic education traditionally comes very close to the first, generally controlled model (Central European model). However, from the beginning of the 1990's, there has been a conscious movement towards less rigid and more open structures of study programs.

These developments are based on two partly interdependent ideologies. Firstly, the process entails deregulation and decentralization of the educational system by increasing the freedom and responsibility of local authorities and educational institutions in planning and funding study programs. Secondly, based on the idea of individualization in education, there is a trend which allows students more freedom in constructing their personal study programs and lets them choose, within the given framework, the courses they prefer. This type of flexibility and freedom of choice has been one of the goals of 16 experimental reform projects in Finland since 1992. The basic means for providing students with more freedom of choice is cooperation between educational institutions, especially between general/academic and vocational schools.

Individual freedom of choice may be regarded as valuable both in itself and as a means for improving student motivation and for creating variance in the qualifications produced. However, discussion can be aroused about the usefulness or quality of the qualifications students achieve with their own choices, especially by those in favour of the prestructured programs. The maturity of young students - in Finland most of them 16 year old - has been questioned and, for instance, it has been suspected that students' motives in choosing courses are less rational.

2. The Reform

In 1992 sixteen local groups of vocational and general education institutions agreed to form experimental units of 2 to 27 institutions. At the local level, each educational establishment was allowed to decide for itself whether to participate in the experiment or not. Within the frame set by the experimentation legislation, the schools of these units cooperate in order to broaden the range of studies offered to their students. The general/academic senior secondary students and vocational students may include courses from both vocational institutions and senior secondary schools in their programs. As a general rule, students can complete the conventional final qualifications - the matriculation examination in the senior secondary school and vocational certificates in vocational schools. Moreover, it is also possible to study for the matriculation examination and a vocational diploma concurrently or earn a so-called combination certificate consisting of both general and vocational subjects. No special curriculum has been designed for the experiment; the students can individually decide whether to utilize the increased options or not.

3. Subjects and Measurements

The data was gathered by questionnaires from 5,600 students who completed the comprehensive school in 1993. These students were the second age cohort which participated in the experiment. They come from eight municipalities, four of which were involved in the experiment (the research group) and the other four were not (the control group). Consequently, it was possible to make comparative analyses between the two groups.

In spring 1995 the students from the four experimental units (N=900) and the students of schools not involved in the experiment (N=1 727) participated in this study at the end of their second year of studies at the upper secondary level.

The students rated a set of 13 items as possible motives or reasons for including optional modules or courses in their study programs, from their own schools or some other school. In rating the influence of each item in their study choices, the students used the scale 1 - 5 (1 = not at all, 5 = very much). A factor analysis of the items suggests three dimensions of student motivation: ***1) usefulness of the modules for work career and/or further studies, 2) personal interest in the substance of the modules*** and ***3) external motivation***. On the basis of these three motivational dimensions it was examined how reasons and motives for study choices differ between the vocational school students and academic/general upper secondary school students as well as between experimental schools and the schools not involved in the upper secondary experiment. Additionally, possible differences in the reasons and motives for study choices due to gender, success at school and family background (father's level of education) were studied.

4. Results

Both senior secondary and vocational school students found usefulness for work career and further studies and personal interest to be the main motives and reasons for their study choices. External causes such as choices made by schoolmates, parents' opinions and easiness of studies clearly had minor significance as grounds for study-choice decisions.

In experimental schools and in the schools not involved in the experiment the reasons behind the students' choices were very similar. The usefulness for work career and further studies and personal interest were important for both groups. External causes were not found notable.

Some differences were found as grounds for study choices between the two school forms (vocational schools, upper secondary schools). Vocational students emphasized the reasons related to practical usefulness and work career. In contrast, the general/ academic upper secondary schools students favoured personal interests as reasons and motives for their decisions. External causes had rather little importance both for upper secondary school students and for vocational students.

The effects of gender, success at school and family background were examined by correlation coefficients. Firstly, correlations are very small in general. Secondly, there are some problems in using correlations in this context. The distributions of gender and success at school differ considerably in both upper secondary and vocational schools. After graduating from the comprehensive school students with better leaving certificates (mostly females), continue in upper secondary schools, and those with lower grades (mostly males) in vocational schools. Due to this, the upper secondary schools are dominated by females and the vocational schools by males. As a result, the gender, success at school and the school form are interrelated to each other in upper secondary education, and in the correlation of each of them also includes the effects of the other two. Because of this, the correlation coefficient is quite problematic method in this context.

5. Conclusions

Early at the beginning of the experiment, some criticism was presented about allowing the students an opportunity to escape intensive study trough freedom of choice. But, in practise, students did not favour easy choices. The reasons behind their choices were rational varying from individual interest and the need for change to the eligibility for further education.

There were no differences in the reasons and motives of study choices between experimental students and the students not involved in the experiment. On the other hand, this means that the grounds for choices did not differ in the cases of broad and limited possibility to choose courses from their own schools and other schools. From the viewpoint of upper secondary experiment, it is interesting that more flexibility in choosing courses did not effect the motives and reasons behind the choices. The increased freedom in constructing one's own study program did not allure the students to make easy choices. On the basis of these results it can be stated that there seems to be no need to restrict opening the freedom of choice for all students at the upper secondary level.

The Business Incubation Concept: Global Possibilities for Vocational-Technical Education

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Abstract

Applying the business incubation concept to economic development is not new. Around the world this concept has been used by governments to boost their small-business structures to support national economies. This paper suggests two possibilities to extend the impact of this concept on economic development. First, the paper suggests a more active role for postsecondary vocational-technical institutions in economic development and proposes a holistic approach including entrepreneurial education and training and direct support of business incubators. This proposition is supported by research conducted in the United States involving case studies of promising business incubation programs supported by two-year colleges. Second, it is suggested to position postsecondary vocational-technical education in a global perspective to prepare the future entrepreneurial base for the needs of more challenging and collaborative international trade relations.

Introduction and Purpose

Participation in community economic development is a dynamic process requiring proactive participation in strategic planning and involvement in broad-based community partnerships. Traditionally, community and technical colleges react to industry or societal needs when these needs become obvious and urgent. However, current developments in the national and international economy suggest the need to strengthen a proactive commitment to community development. The challenge is to integrate technical postsecondary education with economic development to improve the quality of education and training services and programs that stimulate entrepreneurial development (Melvin & Chmura, 1991; Phelps, 1992). Some states have already demonstrated the benefits of the participation of community/technical colleges in providing technical assistance and technology transfer to small businesses (Carmichael, 1991). Of these opportunities, business incubation, offers perhaps, one of the most comprehensive strategies to promote entrepreneurship, help create jobs, stimulate growth, and revitalize rural areas or depressed neighbourhoods.

Business incubators are facilities which provide commercial space at low cost and a host of business services to help entrepreneurs survive successfully in earlier stages of business development (NBIA, 1991). Given the increasing globalization of trade, shared understandings of international markets linked to entrepreneurial development may enhance vocational-technical education and training programs in local communities around the world. With these ideas in mind, the purpose of this paper is to present research findings describing: (a) the involvement of two-year colleges in economic development through business incubation in the United States, and (b) implications for developing shared understandings of entrepreneurship tuned to the needs of global economies.

Theoretical Background

Assuming a leadership role in community economic development appears to be a natural role for two-year postsecondary institutions in the United States. They make up the bulk of higher education institutions, are located across the nation in rural, urban, and suburban areas; and usually have closer ties with key community stakeholders (Farnsworth, 1991). However, the contribution of two-year colleges to business incubation has been rather modest and few studies have described their involvement in this concept within the context of economic and entrepreneurial development. As new challenges and demands derive from global economic competition, an understanding of business incubation and opportunities for a more active role in economic development--learning from promising experiences of two-year colleges--is critical to provide future direction for postsecondary technical education institutions as we enter the 21st century (Weinberger & Burnier, 1991). Indeed, in the United States as well as in the rest of the world, two-year colleges can become more active agents in efforts designed to revitalize local economies who are struggling to keep up with the forces of increased international competition. However, the conversation to internationalize the curricula has been narrowly devoted to language skills and development of geographical understandings (O'Bannion, 1989). Programs have also focused on student and faculty exchanges to get international educational experiences. Further these strategies lack information and opportunities for building shared understandings of common problems and solutions to assist small businesses which usually support the bulk of employment in communities around the world (Gell & Crupi, 1991).

Even though a number of studies have been conducted on business incubation, the focus has been on financing and operational management based primarily on input from incubator managers (e.g., NBIA, 1991). Other studies have focused on the participation of four-year colleges to support the incubation concept, especially in the area of high-tech enterprises and development (see for example Mian, 1993). However, few case study resources focusing on the participation of two-year colleges on economic and entrepreneurial development are available. To this end, case studies can be a valuable resource to facilitate the transfer of knowledge in classroom activities, professional development, and administration of vocational-technical programs and services. As proven in business, industry, and various educational fields such as law and management, the potential use of case studies for education and training purposes is substantial. They can be used to: (1) describe situations or events of interest; (2) encourage problem solving; (3) stimulate critical thinking; (4) generate group discussion; and (5) train personnel using different case study scenarios. Designed appropriately, case studies can provide contextual information about efforts to foster entrepreneurship in various community scenarios which will assist in understanding different approaches to business incubation (Stake, 1994).

Method

This report presents nine cases studies built in the context of two-year college experiences in economic development and entrepreneurship. The case study design represents a complementary research strategy to a national survey of entrepreneurs in business incubation, including incubators affiliated with postsecondary vocational-technical institutions and colleges (Hernández-Gantes, Sorensen, & Nieri, 1996). Case studies were designed to verify survey information via personal insights of business incubator managers, entrepreneurs in and out of incubation, two-year college staff/faculty, and postsecondary students interested in entrepreneurial opportunities. The approach taken to design and develop case studies was guided by four central questions: (1) What are the opportunities and challenges to support business incubation in the community?; (2) what can we learn about entrepreneurship development in and out of business incubation?; (3) are there other potential opportunities for two-year technical colleges to participate in the economic development of the community?; and (4) what are the experiences and perspectives of minority and female entrepreneurs as they participate in business opportunities?

The analysis of the case study design derived from a combination of what Stake (1994) called the "collective study" design. Under this design, each case is reviewed in depth to develop a better understanding of the issue under consideration and build a theory around the guiding questions. Based on these this premise, each case per se played a secondary role in facilitating our understanding of entrepreneurship and opportunities for two-year technical colleges to participate in economic development in the community. The goal was to examine a variety of cases describing different contextual situations and perspectives to develop insights about both particular conditions and general applications across cases. This approach allowed the study of: (1) similarities across case studies in a variety of contexts, (2) opportunities for participation in economic and entrepreneurship development unique to certain places, (3) experiences of key stakeholders functioning under different circumstances.

Findings and Conclusions

Four major goals seem to be the source of the involvement of two-year technical colleges in community economic development in the United States: (a) job creation to support the local economy, (b) diversification of business opportunities to expand economies relying on few sources of economic support, (c) revitalization of neighbourhoods through support of new small business ventures, and (d) provision of education and training opportunities for dislocated workers, retraining of employees, and entrepreneurial development. To accomplish these goals, implementation efforts are sometimes carried out based on a comprehensive approach but in most cases the focus is only on one or two goals. Thus, the involvement of two-year colleges to foster economic development in the community is usually found in three levels: (a) Support of business incubation, (b) provision of business related services, and (c) education and training opportunities offered to the general public. The purpose and extent of the involvement to support these efforts vary according to the resources and circumstances leading to the implementation of these efforts. For example, in rural areas the focus appears to be in job creation and diversification of the local economy. Therefore, two-year colleges respond by supporting business incubator in partnership with community groups. In urban areas the emphasis is on creation of jobs and revitalization of depressed areas in need of economic support. Suburban efforts, on the other hand, focus on the growing and changing needs of both employers and employees through provision of business related services, education and training opportunities, and stimulation of new small business ventures in the community. However, the quality of the involvement of postsecondary institutions in business incubation seems to be rather weak. Once a program is established (e.g., a business incubator), the operation may become a satellite entity and, in many instances, there may be no linkages with the college other than funding. Further, we found practically no connecting activities between the sponsoring colleges and local high schools to expose students to entrepreneurial ventures. The lack of strong operational linkages between the 2-year colleges and these programs set up to foster economic and entrepreneurial development is reflected in a variety of managerial forms of these programs. Indeed, even though two-year colleges sponsor business incubators and provide business related services through assistance centers, and/or courses with focus on entrepreneurship, there is usually a strong manager or director at the operational level who makes up for the weak involvement of the sponsoring institution once the operation is running. Based on these findings the question that remains is, what can we do to improve the involvement of two-year colleges on business incubation efforts to revitalize community development?

Global Implications

Retooling the role of postsecondary technical education to include a proactive involvement in community economic development requires of careful planning, and a clear understanding of the implications. Based on events and experiences described in case studies, the implications for postsecondary technical education—as an agent to facilitate economic development—lie in six major areas, which may very well apply to other countries: (a) retooling the traditional educational role to provide customized training programs in close partnership with local industry with focus on new competencies and skills; (b) serving as an educational broker to government agencies to provide the facilities, human resources, and the necessary linkages for a variety of training programs; (c) fostering entrepreneurial development through education and training opportunities aimed at facilitating the transition of interested individuals to business ownership; (d) facilitating connecting activities between schools—both secondary and postsecondary—and local businesses to expose young students to entrepreneurship as another career path; (e) supporting business incubation in the community with focus on entrepreneurial development through comprehensive services rather than just affordable space; and (f) providing business and industry related services to demonstrate improved processes and technologies.

To administrators interested in implementing or improving efforts on any of these opportunities described above, case studies illustrated different scenarios in urban, suburban, and rural settings. A collective understanding of the diverse circumstances and common contextual characteristics may be useful to develop a vision for individual institutional efforts or to identify opportunities for improved participation in community and entrepreneurial development. Given the fact that globalization of our economies is a reality, two-year colleges offer great opportunities for providing the necessary leadership to fine tune local programs and services to prepare more competitive entrepreneurs, current and future, mindful of international issues and perspectives needed to succeed in today's world.

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The Challenge for Vocational Education and Training in Hong Kong as Part of the "One Country Two Systems" Philosophy

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Abstract

Hong Kong, which has for three decades enjoyed almost uninterrupted economic success and prosperity, now stands on the threshold of yet another major challenge as it returns to China under the "Basic Law" which enshrines the philosophy of "One Country Two Systems". The basis of the economy has evolved from that of an anthropoid through a robust manufacturing centre to an increasingly commercial and servicing centre. A vital factor which has helped bring this successful change is Hong Kong's system of Vocational Training and Technical Education which is flexible and seeks to match output of trained manpower with the economy's changing requirement. It is of paramount importance that this system prevails beyond 1997 as Hong Kong's prosperity will only be sustained by continuing to produce a well educated and skilled workforce to satisfy the economy's changing needs. This paper outlines some of the historical background and current status of vocational training and technical education in Hong Kong and looks forward to the positive effects that the change in sovereignty will bring with respect to the closer economic, social and cultural links with China that could lead to the opening up of a vast market for Hong Kong's products and expertise.

Historical Context

2. Vocational training and technical education in Hong Kong have a relatively short history in comparison with other developed countries in

the world. The early milestones were the establishment of the Hong Kong Technical College at Hung Hom in 1957 (which was transformed to the Hong Kong Polytechnic in 1972 and the Hong Kong Polytechnic University in 1995), the opening of the first technical institute in 1970 and the enactment in 1976 of the Apprenticeship Ordinance, and the Industrial Training (Construction Industry) Ordinance and the Industrial Training (Clothing Industry) Ordinance. The most important milestone, however, was the establishment of the Vocational Training Council (VTC) in 1982. This statutory body is enacted with the responsibility for ensuring that Hong Kong has a comprehensive system of technical education and industrial training suited to its developing needs. At the outset, the VTC took over from the Education Department the responsibility for the management and operation of the then five Technical Institutes which was later increased to 8 to satisfy the increase in demand. In 1990 one of the Institutes was closed down for conversion to a Technical College. In 1996/97 the Technical Institutes enrolled circa 14,000 full-time students, 11,600 part-time day and 23,300 part-time evening students on more than 300 courses in 16 disciplines at Craft and Technician level.

3. In parallel with the development of the Technical Institutes, the VTC also undertook the building of Training Centres. In 1982 when the VTC was established, it had no Training Centres. It now operates a total of 24 such centres, 6 of which operate courses related to the commercial and services sector in banking, hotel, information technology, insurance, wholesale/retail and import/export trades and Management Development. In 1996/97 the 24 Training Centres together provide a total of about 43,000 training places.

4. In 1989, when the government decided to increase the number of undergraduate degree places, the VTC accepted the government's request to take over some of the sub-degree courses at Higher Diploma and Higher Certificate level from the then Hong Kong Polytechnic and the City Polytechnic to enable them to expand their degree programmes. This resulted in the VTC establishing two Technical Colleges which began operation in September 1993 by offering 31 full-time Higher Diploma courses and 37 part-time Higher Certificate courses. In 1996/97 the total enrolment in the two Colleges is circa 5,100 full-time, 1,300 part-time day and 7,400 part-time evening students.

5. To ensure that the training and technical education programmes operated by the VTC are up-to-date, relevant to the economy's needs and adequate in terms of both quality and quantity 20 Training Boards were set up under the Council, one for each major economic sector. The Boards' main functions include the assessment of the manpower needs of their respective sectors which they do through surveys conducted once every two years. The survey findings provide both the VTC and the government with information which enables a balance between the demand and supply

of trained manpower to be made. The information is also used by the Technical Colleges and Technical Institutes when planning their student numbers. The Board's membership include prominent employers from the respective sector and provide an important forum for, among other things, collecting views and feedback that help to shape courses provided by the Technical Colleges, Technical Institutes and Training Centres.

6. The VTC also collects feedback after students complete their courses by means of surveying the current year's graduates and tracer surveys of students who graduated five years earlier. Periodic surveys are also conducted to seek the views of employers on the performance of graduates. These quality assurance measures are taken to ensure that the courses provided satisfy the needs of industry and commerce.

7. The VTC is therefore, unique in that it integrates manpower assessment and forecasting with over 100,000 education and training places covering craft, technician, higher technician, enforcement of an Apprenticeship Ordinance, management development as well as training of the disabled for open employment.

8. The success of Hong Kong has historically depended upon the ability of its businesses and workforce to respond flexibly and rapidly to the changing environment of the economy and demands of the global market. Because the rate of economic change is unlikely to abate it is absolutely essential that Hong Kong's vocational education system continues to retain its flexibility and ability to respond to changing manpower requirements arising from these changes. Equally important, vocational education must also remain as broad-based and up-to-date as possible and with a heavy information technology content.

9. In absolute terms, Hong Kong's manufacturing industry has grown tremendously but the growth has mainly taken place outside Hong Kong as the bulk of manufacturing companies have relocated their manufacturing operations across the border into China, i.e. made by Hong Kong not made in Hong Kong. This has result in the number of people directly employed in the manufacturing sector in Hong Kong have shrunk from about 850,000 in 1985 to about 390,000 in 1995. However in the same period the numbers employed in the services sector increased from 1,080,000 to about 1,870,000. The loss of about 460,000 manufacturing jobs, mostly at the operative level, therefore only resulted in the unemployment rate going up by about 1%. This was mainly due to the measures taken by the government in the last 15 years to raise the general education level of Hong Kong's young people and invest in vocational education and training.

Towards the 21st Century

10. The theme of the Conference projects the impression that something momentous will happen to education in the year 2000, but, there is nothing really magical about the year 2000 per se. It is just another year and the planning of vocational education is an ongoing requirement for Hong Kong which should encompass that date and beyond.

11. The change of sovereignty in 1997 will also have an effect upon Hong Kong. The positive effects will be closer economic, social and cultural links with China which could lead to the opening up of a vast market for Hong Kong's products and expertise. The vocational education and training systems in China are different than in Hong Kong hence there is a great need for us to understand each others requirements and solutions to what are becoming common problems.

12. The Basic Law provides China / Hong Kong with the "One Country Two Systems" philosophy which will protect and slowly evolve the current systems and processes over the next 50 years. However, in economic terms the "One Country" will significantly benefit from the continued success of Hong Kong to remain the major international centre for trade and finance in the East Asia region. If Hong Kong is to continue to flourish then its education and manpower training needs must be satisfied through the continued partnership between the new government and the private sector investing in vocational education and training within the "Two Systems" concept.

13. The various Special Economic Regions being developed by China are rapidly moving forward their industrialisation and in many cases supported by investments from Hong Kong. In particular the developments just north of the current "border" in China are inexplicably linked with Hong Kong as the base for most of our manufacturing factories. The need for "cross border" vocational education and training is becoming more and more important as time passes. The flow of skilled workers from Hong Kong working in China is growing as is their need for support for their continued education and training. Likewise there is a great need for the people from southern China to develop their vocational skills to enable them to enhance their contribution to the combined success of the region.

14. To satisfy these future challenges the vocational education and training provision in Hong Kong needs to demonstrate flexibility to change. The time frame over which changes are made will need to be greatly reduced and education and training at all levels need to be much more responsive to the customers' needs; that is the needs of students, employers and the new government. To this end, the training providers will need to better and more quickly predict, anticipate and implement the customers requirements than we do at present. In addition, to remain

competitive in that new ball game, we will also need to produce graduates who are more computer literate, have better communication and interpersonal skills, be more socially aware and have a proper attitude towards work.

15. The proficiency of language and communication skills among the young is a vital aspect of working and social life. Hence it is essential that such communication is efficient and effective. Proficiency in English is and will remain vital for Hong Kong if it is to maintain its position as an international centre for trade and finance. It is therefore an important part of the further training and education at the vocational level to improve the communication and language skills of the students. However, with the increasing economic links between Hong Kong and China, Putonghua is also becoming more and more important and proficiency in the language is now a requirement for many jobs. The VTC has already introduced Putonghua into the curricula of many of its courses and plans are afoot to introduce it into others. A trilingual society is an inevitable requirement.

16. It should be evident from the above that people are the life blood and foundation on which the economic success of Hong Kong will continue to be built. Hence, we must go on investing in training and technical education to equip our work force with the necessary skills and technologies to meet future demand. We must also go on improving our vocational education system to ensure that it remains cost-effective and keeps abreast of economic changes. To this end, we all have a part to play and must work together.

17. The new government needs to continue to review and promulgate its policy on vocational education in the light of economic change to set out clearly the roles of the various parties concerned, including the government itself. It needs to give positive commitments and provide the necessary resources to facilitate the delivery of an agreed vocational education programme. In addition, the government needs to coordinate the efforts of the various education and training bodies to ensure that the policy can be implemented in an efficient and effective manner.

18. As previously mentioned, the VTC needs to ensure that its courses continue to meet the needs of customers through a comprehensive quality review and audit system, that an effective team of teaching staff and instructors are employed to ensure that students and trainees gain maximum benefit from their programme of study or training, and that a flexible planning system exists to enable Colleges and Institutes to respond quickly to the changing needs of society.

19. Employers need to provide enhanced support by investing in vocational manpower training, by participating in the development and validation of courses, by recognising skill training and technical education by giving incentives / rewards to employees who have undergone proper

programmes and by reserving particular job functions for staff who have the appropriate qualifications, training and professional recognition.

20. Young people need to realise that the economy needs all levels of manpower and that society does not require everyone to have a degree to be successful. It should be recognised that vocational training and technical education is an essential requirement for the future success of Hong Kong. Training programmes should embrace the concept of "education for life" by instilling in students the desire to continually acquire new and upgrade their skills and knowledge so that they are Hong Kong can continue to take advantage of the technological revolution.

21. We believe that our vocational training and technical education system will continue to play a vital role in the success of our economy. It will continue to help Hong Kong maintain its position as the premier centre for international trade, finance and service well into the 21st century. In summary, this system will enable us to:

- maintain a balanced supply of properly trained and educated manpower capable of sustaining economic growth as well as meeting new challenges arising out of economic re-structuring;
- ensure a high and uniformly skilled work force and enhance their versatility and employability;
- promote due recognition of skill training and raise the social status of skilled workers; and finally
- enhance quality and increase productivity.

22. Hong Kong has enjoyed many achievements in the past three decades or so and we are confident that the VTC will continue to play a vital role in ensuring that Hong Kong achieves even greater successes and prosperity well into the next millennium.

The Challenges of the 21st Century for Vocational-Technical Education in Taiwan, Republic of China

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Abstract

As we are approaching the 21^{st} century, many researchers, economists, and professionals firmly believe that a country's viability in the global market will rely heavily on a highly skilled workforce (Smith, 1995; Vo, 1996). The vocational-technical education system should play a vital role in preparing such a workforce. In addition to the external challenges of economic competition, vocational-technical education in Taiwan is now facing some internal challenges. It is important to explore the nature of the challenges of the 21^{st} century for vocational-technical education and to examine the appropriate measures responding to these challenges.

This study employed the method of literature analysis to yield the findings and to draw conclusions. The first finding related to the nature of challenges included the global economy, the implementation of the national plans, the educational reforms, the demand for social transformation, the request from parents, students' aspiration for pursuing further education, and the trends of life-long education and recurrent education. The second finding related to the measures included providing multiple educational alternatives at the higher education level for students to pursue further education, experimenting with comprehensive high school programs, promoting technical skill programs at junior high schools, improving the ways of admitting students to the higher level schools, designing more flexible curricula, conducting in-service teacher training programs, implementing skill licensing policy, and providing vocational-technical education for the handicapped and minority students.

As we are approaching the 21st century, many researchers, economists, and professionals firmly believe that a country's viability in the global market will rely heavily on a highly skilled workforce (Vo, 1996). Hedrick Smith (1995) further pointed out the nature of the change and urged people to rethink the ways to prepare a well-educated workforce for the industry. The vocational-technical education system should play a vital role in preparing such a workforce and emphasize flexible educational alternatives, empowerment, partnership, and teamwork. Taiwan is now the 13th world's largest trading nation and is experiencing the same economic challenge as the U. S. for better productivity and competitiveness. On the other hand, some of the internal factors also continuously impact vocational-technical education in Taiwan and force its system to be adjusted for better educational outcomes. These factors include the new nation's economic development, the educational reform movements, the demand for social transformation, the request from parents, and the need for more educational opportunities (Yang, 1996). Thus, in facing both external and internal challenges, the vocational-technical education system in Taiwan has to be examined in order to improve the educational quality and effectiveness.

The need for national economic growth in order to compete with other countries in the world is one of the priorities in Taiwan. The vocational-technical education system is required to foster more technicians and professionals to create and support the economic development. The other priorities are the adjustments resulting from the implementation of the national plans, the educational reforms, the demand for social transformation, a high per capita income of U S $12,000 and less children in one family, students' aspiration for pursuing further education, and the trends of life-long education and recurrent education.

Betsy Brand (1992) envisioned vocational-technical education for the 21st century and suggested five areas for planning the education strategically. Her vision included: the development of close partnership with the business community, the integration of academic and occupational curricula, the strengthening of comprehensive guidance and counselling programs, the move towards greater accountability, and finally, the establishment of the Tech-Prep Associate Degree (TPAD) programs. Four years later, Dyrenfurth (1996) conceptualized a vision that: guided the evolution of a system of excellence for technical education, depicted the characteristics of an ideal system of technical education delivery and support, and informed the development of the blueprints for the future. Specifically, he suggested an accessible networked system, a reasonable governance and funding structure, a population with technological literacy as well as technical competence, an infrastructure for promoting technical education, and a performance based assessment and licensing system.

Similarly, as the world constantly moves towards the state of "the global village", the vocational-technical education system itself in Taiwan should be modified in line with the global change. After the collection of the related literature and the reports of numerous panel discussions, the Ministry of Education focused on some important measures to respond to the challenges. These measures were: providing multiple educational alternatives, expanding technological and vocational education at the higher education level for students to pursue further education, experimenting with comprehensive high school programs, promoting technical skill programs at junior high schools, improving the ways of admitting students to the higher level schools, designing more flexible curricula, conducting in-service teacher training programs, implementing skill licensing policy, and lastly, providing vocational-technical education for the handicapped and minority students (Wu, 1996; Yang, 1996). Although Brand (1992) and Dyrenfurth (1996) developed their own visions of vocational-technical education for the next century, their emphases were still on the quality of vocational-technical education and its capability of preparing a highly skilled workforce. The essence of the measures proposed by the Ministry of Education in Taiwan has the same emphases.

Purpose of the Study

This study explored the nature of the future challenges for vocational-technical education in Taiwan, R. O. C., and examined the appropriate measures responding to these challenges. For the nature of the challenges, the findings of the study yield some major internal and external factors. For the measures to respond to the challenges, some effective and appropriate items will be stated.

Method and Procedure

Basically, literature analysis was employed as the main research method. A review of the related research reports, government documents, articles, journals, and the relevant computer data base was conducted to form the knowledge base for the purpose of analyzing the nature of the challenges and subsequently the appropriate measures. Through the review of literature, the factors of challenges were determined. The next step was to synthesize the collected data to yield the findings of the study, i.e., the challenges, and the measures proposed to respond to the challenges.

Findings and Conclusions

The nature of the challenges of the 21st century for vocational-technical education in Taiwan, R. O. C., include both external and internal factors directly relevant to the challenges. The external challenges is basically the economic challenge for better productivity and competitiveness in the global economy. The internal challenges for the next century are: the implementation of the national plans, the educational reforms, the demand for social transformation, the request from parents, students' aspiration for pursuing further education, and the trends of life-long education and recurrent education.

Some appropriate measures responding to the challenges were determined to be effective by examining the possible effects of the measures based on the theories and concepts of vocational-technical education. Among these measures, some of them correspond with the challenges individually, and the others correspond with the challenges collectively. These measures include: providing multiple educational alternatives at the higher education level for students to pursue further education, experimenting with comprehensive high school programs, promoting technical skill programs at junior high schools, improving the ways of admitting students to the higher level schools, designing more flexible curricula, conducting in-service teacher training programs, implementing skill licensing policy, and providing vocational-technical education for the handicapped and minority students.

Implications and Recommendations

Vocational-technical education plays a major role in helping students get the knowledge, skills, and attitudes necessary for future work, and become world class workers. Since Taiwan and other countries in the world are facing similar challenges of the 21st century for vocational-technical education, it is crucial to analyze the nature of the challenges and to design the most appropriate measures to cope with the change brought by these challenges. Vocational educators need to plan strategically in advance for the future and to adjust the vocational-technical system by looking at such items as necessary components for a successful system, service delivery, quality, educational trends, and ways to educate a world class workforce. Constant improvement and thoughtful review of the system is suggested to meet the need of the clientele and at the same time to respond to the social, political, educational, economic, and technological changes.

In essence, Yang (1996) pointed out the following four directions for vocational-technical education which can best explain the reasons for proposing the measures made by the Ministry of Education: (1).Developing a more flexible system of technological and vocational education to cope with the need of educational reforms, (2).Training a skilled workforce and professionals for national construction, (3).Promoting students' career development in line with parents' request, and (4). Enhancing the quality of education in accordance with the world trend.

By matching the challenges with policy directions and the measures, a new vision of vocational-technical education is clearly depicted. The whole process of forming the necessary measures becomes an effective model for the planning and implementation of vocational-technical education today and in the future.

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The Expert Learners Workshops Project

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Abstract

One of the challenges which many vocational education and training institutions will face in the 21st Century will be to educate and train students with less resources than before. One possible solution to this problem will be to train students to become better learners.

This paper will discuss the Expert Learners Workshops Project in the College of Higher Vocational Studies at City University of Hong Kong. The Project team researched the learning and study strategies of the highest achieving students in the College using the Learning and Study Strategies Inventory (LASSI). The LASSI was developed over a 7 year period in the United States and has been used at more than 1400 colleges and universities in the U.S.

The research results from the Hong Kong study were quite surprising and led the researchers to re-evaluate the role of motivation in student achievement. From the research results, a series of five workshops was then created to train students in the College to become better learners. The results of the LASSI study and the implications are addressed in this paper.

Introduction and Purpose

Along with its rapid economic development in the past 15 to 20 years, Hong Kong has seen an exponential growth in the number of students for whom tertiary education is now a reality. Since the early 1980's, enrollment at universities in Hong Kong has risen more than 250%. Many of those students are studying in sub-degree programmes, the so-called diplomas and higher diplomas. These diplomas and higher diplomas are vocational education awards.

As the 1990's draw to a close, however, growth in higher education in Hong Kong, including sub-degree vocational education programmes, is reaching a plateau. Higher education in Hong Kong is currently undergoing a period of consolidation, which will continue into the early years of the 21st century. With calls for better quality in education, more accountability to the public, and a realignment of resourcing away from vocational programmes, educators and practitioners in vocational education find themselves with larger classes, more teaching hours per week, more assignments to comment on and mark, and more formalized, time-consuming procedures for accountability in their teaching, applied work, and administrative duties.

Under such conditions, how can educators and practitioners insure that students are getting a quality education? The demands on lecturers or teachers or tutor's time have increased significantly and that has meant less individual attention towards students. How can they insure that students are internalizing the quality culture which institutions have, at least on paper set, up?

In the College of Higher Vocational Studies at City University of Hong Kong, we have taken steps to promote the internalization of a quality education in our students. It operates on the premise that students must take a share of responsibility for their own learning. It operates on the premise that students can and indeed should be autonomous learners. Some students, whom we call "Expert Learners", are those students who have already proven their ability to be autonomous learners. Other students will need training to equip themselves with the necessary study skills. This attempt to identify "expert learners", to learn what accounts for their success as learners, and attempt to teach other students the 'secret of their success' is what the Expert Learners Workshop Project is all about.

Conceptual and Practical Bases of the Project

In conceiving the Expert Learners Workshop Project, we built on two concepts. First of all, learning and teaching are two interlocking processes. To use a common analogy, teaching and learning are like two sides of one coin. Secondly, in the College of Higher Vocational Studies and elsewhere in the university there was an initiative to identify expert teachers through a programme known as the Teaching Excellence Awards. However, we believed that an effort should be made to identify expert learners. More attention needed to be paid to the learning process which is locked into the teaching process. In other words, we wanted to focus on the learning side of the coin. The practical benefits would be to enhance student learning and to make their experience in the College more valuable. We expected that not only would students benefit from learning how to become better learners, but future employers and the community as a whole would have graduates who were better prepared for their future careers in Hong Kong.

Methods and Procedures

In order to carry out the Expert Learners Workshop Project in the College of Higher Vocational Studies at City University of Hong Kong, we had to first identify who were the existing "expert learners" in the College. We felt that the most practical way to do this was to go by Weighted Point Average (similar to Grade Point Average), which is roughly equivalent to the averages of the students modules (or courses).

In the College of Higher Vocational Studies there are four divisions, or departments: Commerce, Language Studies, Social Studies, and Technology. The official medium of instruction is English. Almost all of the textbooks and most of the teaching materials are in English; some lectures and tutorials are also conducted in English. There are a total of 12 higher diploma programmes, or courses of study, offered by the four divisions, and one diploma course. Higher diploma courses are three years duration; the diploma course is two years. We selected the top three students in each of the higher diploma courses, based on their Year One or Year Two academic results. We therefore studied the learning and study strategies of the three students in Year One and Year Two in each programme who had achieved the highest WPA the previous year. In addition, we studied the top three students in the final year (Year Two) of the Diploma programme, based on their Year One results.

In order to study the learning and study strategies of the top 64 students in the College of Higher of Vocational Studies, we considered many different methods such as semi-structured interviews or creating checklists, but we finally settled on the Learning and Study Strategies Inventory (LASSI), with a short glossary of terms in English with their Chinese equivalents. The LASSI is an assessment tool for diagnostic and prescriptive purposes. There are 77 questions assessing thought processes and behaviours in 10 areas: Attitude, motivation, time management, anxiety, concentration, information processing, selecting main ideas, study aids, self testing, and test strategies. To the best of our knowledge, the project was the first one in Hong Kong to use the LASSI.

After compiling the results, we selected the six LASSI areas which the 64 respondents had scored the highest and wrote five workshop syllabuses which would address those areas. The titles of the five workshops were: General Study Skills, Reading Skills for Academic Purposes, Listening Skills for Attending Lectures, Research and Writing Skills, and Preparing for Examinations. We then developed teaching materials for the five workshops, which were two hours duration each and were held over a 7 week period.

We also promoted the workshops by putting posters up around the College; sending each College student an Email message with the schedule and purposes for the workshops and the student benefits; and publicizing the workshops in the College newsletter.

Findings

At the time of publication of this document it is still too early too gauge the success of the workshops on students' learning. However, average attendance at each workshops was about 8 students.

We can present the first set of results in some detail, i.e, the results of the LASSI survey. After compiling the data we calculated the mean for each of the 10 LASSI areas to get a 'Profile of an Expert Learner'. Table 1 on the following page gives that profile. The LASSI areas have the following abbreviations in the table: ATTI (Attitude); MOTI (Motivation); TIME (Time Management); ANXI (Anxiety); CONC (Concentration); INFO (information Processing); SELE (Selecting main ideas); USE (Use of Support Techniques and Materials); SELF (Self-testing , Reviewing, class preparation); TEST (Test Preparation & strategies). The percentiles in the table are compared with LASSI norms in the United States.

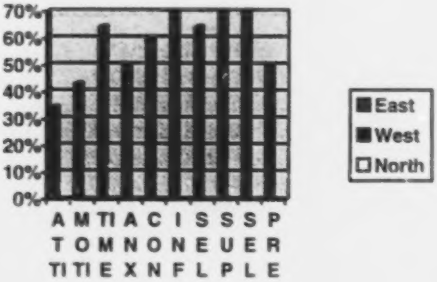

Figure 1. Profile of an Expert Learner

Conclusions

We felt that the very students who most needed to take the workshops did not take them. Those students may have seen attendance at the workshop as one more undesirable chore to fulfil as students, or they may have had part-time jobs to help offset the recent increases in College fees.

Although we had expected that many of the top achieving students would score high in areas like time management, concentration, information processing, support techniques or self-testing, we were quite surprised to find that motivation and attitude among the top achieving students in the College of Higher Vocational Studies was low, as measured by the LASSI. We believe that the main reason is that students would rather be in a degree program. Unfortunately, vocational education is viewed by many students as "second choice". Students' perception of themselves as 'only able to get a seat in a vocational programme' is the chief reason for their low motivation and attitude towards their studies. Nevertheless, after joining the College, many of these high achievers reported verbally that after joining the College, they started to appreciate the programmes offered to them. In subsequent years, both their attitude and motivation improved.

Implications and Recommendations

In order to reach the most number of students who truly need the most help in learning how to become better students, we recommend that the workshop series be upgraded to a credit-bearing, general education course. In that way, students might be more motivated to attend the workshops. In so doing, they would not only get credit but enhance the quality of their College education.

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The Link between Education and Training and Economic Growth: The Distinctive Experience of the 'Tiger' Economies of the Pacific Rim

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Abstract

The current 'World Bank' view of the reasons for the success of the 'Tiger' economies of the Pacific Rim is that one of the main factors is their investment in education and training, and in particular their heavy investment in primary and secondary education in the early stages of the process of industrialisation. This paper, based on research conducted in the 'Tiger' economies, challenges such an interpretation. The authors argue that what is distinctive about the approach to education and training adopted by the 'Tiger' economies is not just that they invested heavily in education and training in the early phase of economic growth, but the success of their governments in putting in place mechanisms which ensure that the education and training system continuously adapts to the demands of economic growth. These mechanisms, which are rarely found in the older industrial societies, take a different form in each society but their function is to ensure that the education and training system delivers new, more complex skills at each stage in the process of economic growth.

Summary

The aims of the paper are to identify the distinctive features of the approach to education and training in the new industrial economies of Asia and to show how this has contributed to economic growth. The World Bank Report (1993), suggests that investment in Human Resource Development was one of the reasons for the success of the high performing Asian economies (HPAEs) in generating rapid economic growth throughout the last two decades. It was this rapid growth which differentiates them from the developing economies and enabled them to pull away from the rest of the developing world. However, the 1993 World Bank Report does not move beyond the confines of conventional human capital theory to explain how the investment in human resources has created growth among the Asian economies. More recently, Campos and Root, (1996) in their attempt to develop further the World Bank approach, have elaborated on the suggestion that one of the mechanisms involved in translating the investment in HRD into economic growth has been the larger investment the HPAEs made in primary and secondary education during the initial phases of the process of industrialisation. The argument we put forward here is that in order to understand why the investment of the 'Tiger' economies in HRD has been so successful, we need to look beyond the spillover effects of initial investment in primary and secondary education put forward by the "World Bank" school (Campos and Root, 1996).

Research into the experience of Singapore and the other 'Tiger' economies reveals a consistent pattern in the political management of human resource development, whereby governments have established mechanisms which link the supply and demand for labour, ensuring that as the demand for skills changes, this is immediately met by changes in supply. At each stage of economic growth new industries are established which make different demands on human skills and therefore one-off investments in education are not in themselves a sufficient explanation for what we have observed. As the higher value added industries are established new and more complex demands are made of humans during their performance at work. To deliver the requisite skills means governments need to be in a position to identify the requisite skills required by the economy and have the means of amending and adjusting the content of the curriculum and the form in which education and training are delivered. This in turn requires them to establish mechanisms to ensure that these adjustment are made and that the output of the education and training systems meets the needs of existing and emerging industries. To comprehend the mechanisms involved, and how they operate, means moving the analysis beyond the parameters of conventional human capital theory into the sphere of the political management of the society as a whole.

The research on which this paper is based was funded by the UK Economic and Social Research Council under its Asia Pacific Initiative. The methodology consisted of a series of extensive interviews with government officials, industrialists, educationalists and worker representatives in Singapore, Taiwan, Hong Kong and South Korea together with the analysis of secondary data from those four societies. The focus of the research was to establish the extent to which the distinctive model of HRD previously found in Singapore (Ashton and Sung, 1997, Ashton and Green, 1996) was also characteristic of the three other 'Tiger' societies. These characteristics were first, that changes in education and training provision are tightly linked to the existing and future needs of industry. Second, that the state plays an important role in influencing the demand for the skills required for the next stage of economic growth, for example, it identifies the skills required for future industries and does not leave it to the employers to determine the demand for skills. Third, that the state ensures the output of the education and training system matches the demand for skills from the economy through a series of co-ordinating mechanisms at national level.

Space constraints prevent us from considering all of the 'Tigers' and so we confine out attention to Singapore, Taiwan and Hong Kong. We take Singapore because this has a highly developed system of training and is where our research first revealed serious questions about the conventional neo-classical approach to the analysis of public policies in the field of education and training. Taiwan, is chosen because unlike Singapore it has relatively few multi-nationals and a large group of small to medium sized employers, making it perhaps more difficult for the government to influence the employers demand for skills. If we find evidence of the three dimensions of our model operating there, it suggests that the model is not a function of the economic base. We take Hong Kong because the government has constantly defined itself as following a non-interventionist strategy, claiming to leave the development of the economy to the operation of market forces. If we find evidence of our model operating there this would suggest that the forces driving it are almost independent of the ideological complexion of the ruling elites.

Singapore

Throughout its relatively short history, the state in Singapore has played an important part in linking the output from the education and training system to the demands of industry. At each stage in the development of the economy, as it moved from the production of low value-added to high value-added goods and services, the government has systematically reformed the education and training systems to ensure that the requisite skills are in place for the efficient operation of existing and new industries. In the early stages it restricted its investment in education to ensure that a literate but disciplined labour force was in place to meet the needs of the multi-national companies it attracted. In the latest phase it is actively involved in ensuring that there is a supply of highly educated scientific and technical personnel and that the work-place is being efficiently used as a source of learning or skill deepening to meet the needs of the new knowledge intensive industries.

The Singaporean government has devised a number of ways in which it can influence the demand for labour. Most prominent is the use of its "Vision", which defines the types of industries it wishes to establish and thereby the type of skills demanded by employers. This "Vision" is translated into concrete investments by the actions of the Ministry of Trade and Industry and the Economic Development Board. Thus in the current phase of development, Singapore is only attracting investment in the production of high value-added goods and services. However, this is only one of the tools used by the government, many different policies are used to influence the demand for skills, for example, the government uses its powers of taxation and its system of training to encourage employers to increase their skill demands.

To ensure that the output of skills from the education and training system matches the demand for skills from existing industries and those is wishes to develop, the government has put in place a series of mechanisms to co-ordinate decision making. Central among these in Singapore is the Council for Professional and Technical Education. This group examines available data on existing and future demands for skills and in the light of that makes decisions about the output from the Universities, schools and Technical Institutes. The Singapore Productivity and Standards Board performs a similar function with regard to the development of worker skills.

Taiwan

The experience of Taiwan certainly suggests that the three characteristics we have identified are not confined to Singapore. Like the government of Singapore the Taiwanese government has linked the output of the education and training system to the changing needs of the economy. One of the main ways in which this has been achieved is through not only increasing investment in secondary and tertiary education, but crucially, through changing the ratio between vocational and general academic schools. Over the last few decades this has enabled the government to contain the demand for general academic education and to regulate the flow of vocationally trained personnel into the labour market.

The state has also played an active role in influencing the demand for labour. Like the Singaporean government it has sought to establish new higher value-added industries, but rather than just attracting foreign capital it has established those industries in the public domain, and placed them in private hands once they were viable. By establishing companies, identifying new industries and technologies and using its resources to encourage the establishment of those industries the state acts as the driver behind the process of economic growth. In this way it uses its powers and resources to influence the demand for those skills which are required to move into the next phase of economic growth.

Finally, with regard to the third feature, namely the state playing an active role in co-ordinating the supply of educated and trained personnel in order to meet the current and future demands of industry, here again there are strong similarities with Singapore. The main mechanism used to ensure this co-ordination has been very evident in Taiwan in the form of the Council for Economic Planning and Development which generates the industrial strategy and ensures that other ministries fall into line in meeting the objectives of the economic plans. This ensures that changes in the education system are in line with the requirements of the economy as defined by the ruling elite. Thus on all three dimensions the experience of the two countries is very similar.

Hong Kong

While the experience of Hong Kong would at first sight appear to deviate from this model, on closer investigation it does offer support for the model we propose. While the Hong Kong government has not sought to influence the demand for skills (the second of our dimensions), on the other two dimensions its experience has been similar to the other two 'Tiger' economies. First, during the last two decades it has sought to ensure that the output of the education and training system has responded to changes in the demand of employers for more highly skilled labour. During the 1970s and 1980s, secondary and technical education was expanded and the government took responsibility for delivering some forms of training. During the 1990s, tertiary education was expanded to meet the needs of the service sector. Thus as the economy developed adjustments were made not just in the amount of investment in education, but crucially in the types of skills produced by the education and training system. With regard to the third dimension, while the government has not attempted to influence the types of new skills demanded by the economy, and therefore does not have the over-arching Boards or Ministries which exist in the other two societies, it has put in place mechanisms and policies, which enable the training system to respond rapidly to changes in the demand for skills. The most prominent of these is the Vocational Training Council, a publicly funded body with responsibility for delivering training across the whole range of Hong Kong's major industries and occupations and which has evolved its own mechanisms for ensuring that the delivery of its training responds rapidly to changes in the demand for skills within the economy as a whole.

Implications

In view of these findings we suggest that on its own, a substantial investment in primary and secondary education is not sufficient to explain the contribution of human resource development to the rapid economic growth experienced by the NICs. Our findings suggest that what is also required is that governments also have policies in place which will ensure that both over time, and in the short to medium term, the output from the education and training system is adjusted to meet the needs of economic growth and in particular the rapid changes which are taking place in the demand for skills as these societies move into the production of higher value-added goods and services. In this respect one of the main reasons for the success of the 'Tiger' economies has been their ability at the political level, to management the output of the education and training system and so ensure that this matched the demand for the existing and emergent skills required for successful competition in world markets. In none of these economies has the delivery of the human resources required for rapid economic growth been left to the market. In this respect these societies are also very different from those of the West.

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Vocational Education and Training Projects in Developing Countries: Issues of Quality and Sustainability

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Abstract

This study examines the problem of implementing and sustaining vocational education and training (VET) programs in developing countries. In recent years, increasingly constrained budgets on the part of governments and donor organizations have raised concerns about maximizing the efficiency of investments in all subsectors of education, including vocational education and training. But how can greater program quality and sustainability be achieved?

This study suggests that policy makers, donors and planners need to give much greater attention to understanding the implementing context, appraising project complexity, and fitting projects to local contexts. A model is presented which provides a way to examine the interdependent relationship between the implementing context and the technical dimensions of VET projects. Crucial contextual and technical conditions are identified and discussed.

Introduction and Purpose

Issues of program quality and sustainability are at the forefront of policy concerns. The study examines reasons why VET projects succeed or fail in developing countries. First, contextual conditions are examined. These are probably the most important conditions and include political, economic, policy, cultural and environmental factors. Next, technical conditions are identified which are critical for maintaining quality and sustainability. These include a) factors which relate to project complexity, such as scope of the project, the organizational structure, administrative levels involved, the number of components, and the time frame, among others; and b) project elements, such as financing, management capacity, staffing, instructional resources, and system and organizational capability. Finally, a theoretical model is suggested for examining the relationship between technical and contextual conditions.

Conceptual Framework

Although this study is eclectic in its use of data, its basic conceptual framework is informed by contingency theory and the work of Brinkerhoff & Goldsmith (1992), Fuller & Clarke (1994), Hofstede (1993), Lawrence & Lorsch (1969) and Rondinelli, Middleton, & Verspoor (1990), among others. The research focus is on contextual and technical variables that condition successful VET implementation. Contingency theory suggests that while there are good educational practices, there is no single "best" set of practices. Neither a theoretical optimal mix of resource inputs nor a key set of site-level and classroom management and instructional processes are sufficient to improve quality over the long-term without consideration of the implementing conditions. The successful reconstruction of VET programs and institutions depends on "situational" or "contingency" factors that are specific to the implementing context. Moreover, it is thought that change is best carried out incrementally and only after sufficient experience has been gained and essential management and staff capabilities have been developed.

Procedures and Methods

The research involved three steps. First, a review of the international literature on VET was conducted, covering both primary and secondary sources of information. The literature review revealed a rich body of material on VET in developing countries and provided a broad context within which to interpret international donor experience. A second source of information was obtained from the field experience that the United States Agency for International Development (USAID) has built up in the design and implementation of VET projects. The evaluation reports of twenty-four VET projects were examined in order to determine what factors promoted successful implementation or contributed to project failure. The focus was on two major categories of variables: the conditioning factors in the implementing context, and the technical characteristics of VET projects. A model was formulated for examining issues of VET program quality and sustainability, based the relationship between technical and contextual conditions. Third, in-depth case studies of VET projects were conducted in three countries. This provided the opportunity to test the model and to refine its dimensions.

Findings, Conclusions, and Recommendations

The primary finding was that the relationship between the implementing context, project complexity, and technical elements is of considerable importance. As project design becomes more complex, understanding and accommodating this relationship becomes even more crucial. The projects most likely to succeed are those with a high level of implementing support and a low design complexity.

External and internal efficiency are linked through the interdependent relationship of implementing context and project complexity. If project requirements far exceed the implementing capacity, there is little likelihood that quality VET programs of any type can be implemented or sustained.

The projects most likely to succeed are those with high implementing support and low design complexity. Projects with high support and high complexity may succeed if a strategy of incremental expansion is followed. Conditions of low support and high complexity should be avoided; the most likely outcome is poor training quality and lack of sustainability. In the case of low support and low complexity, the best strategy is to implement a "permanent pilot" project.

VET projects are implemented within the context of education and training systems. A major task of donors should be to assist in the development of the system capabilities necessary to attain the training objectives and sustain operations after donor support ends. If the required system capabilities are not developed, the project will ultimately fail.

VET system design should be balanced and sequences. Total system requirements must be addressed in project design; otherwise institutional distortion is introduced. Some system components must be developed before others. It is particularly important to address the dynamic and uncertain project elements, such as management capacity, and not focus exclusively on the more static project elements, such as facilities and equipment.

System overload should be avoided by designing projects that do not overextend the existing resource and institutional framework, and by not initiating training before the system is adequately developed. The tendency to design overly complex projects (which consequently are poorly implemented and cannot be sustained) should be avoided. It is best to start small and expand incrementally as system capabilities are developed.

Over investment in material resources should be avoided. Excellent instructional results often can be obtained with modest material investments, and in addition, a modest level of investments may actually improve the likelihood of program sustainability because recurrent expenditure requirements are kept at a minimum.

If only limited investments in VET can be made, they should be in the areas of management development, instructor training, and curriculum and instructional materials development. Unless these components are strengthened, investments in physical resources cannot be effectively used.

Finally, introducing change into contexts that are poorly understood is difficult; sustaining projects that have overextended existing implementing capability is impossible; and providing effective training is unlikely if system components do not work well.

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Vocational Course/Program Evaluation

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Abstract

Notwithstanding the care taken in planning, developing, and delivering vocational courses and programs, it is still important to determine their relevance, effectiveness, and cost efficiency. This is done through an evaluation that systematically collects and analyzes the information necessary to make and justify such determinations. The four phase approach to course/program evaluation described by this paper can be used to address as many evaluation purposes as necessary, considering time, personnel, and other resource constraints.

The approach begins with the selection of evaluation targets (Phase 1). This involves considering targets such as course/program development, including the quality of job and task analysis processes, instructional content and setting, and so forth. The second phase — "Develop an Evaluation Plan" — specifies evaluation purposes, identifies the sources of information and information collection methods, schedules evaluation events, and obtains management approval. Phase 3 — "Collect and Analyze Data" — continues with the preparation and administration of data collection instruments and the analysis of data. Last is Phase 4 — "Prepare an Evaluation Report." The activities performed here include interpreting the data and drawing conclusions, making recommendations for improvement, and developing an action plan.

Phase 1 — Select Evaluation Targets

The results of a course/program evaluation are intended to enable decision-making about problems. Therefore, it is important to identify those who make such decisions — training specialists, managers, and others. In selecting evaluation targets, it is critical to focus on the decision makers' information needs. An evaluation effort can go awry if the what to measure and for whom decisions are not addressed.

Training specialists are typically interested in whether the course or program taught what it was intended to teach. Certainly, it is important to know if (a) the learning objectives are relevant to job performance requirements, (b) the instructional methods are effective, (c) test performance is adequate, and (d) skills are transferred to the job.

Management concerns are often different from those of training specialists. One difference is that, within training, decisions affect only the training function, while management decisions can determine if a course or program is expanded or possibly dropped.

Phase 2 — Develop an Evaluation Plan

The five steps in developing an evaluation plan are described under this centered heading.

Step 1. Specify the Purposes

An important reason for evaluating training is to **determine if the purposes of the course or program have been achieved**. Unless these purposes are clearly specified at the outset, it will be difficult to perform a meaningful evaluation. A group of training specialists and managers selected from a list of evaluation purposes taken from the literature, the following eight as the most basic: (a) determine what, if any, part of the training needs improvement; (b) determine needed curriculum content revisions; (c) identify program graduates' impressions concerning the training they completed; (d) identify programs needing expansion or removal; (e) broaden occupational offerings according to trainees' needs; (f) determine the effectiveness of the training in terms of graduate achievement, program operation, value of knowledge and skills, and consistency of content; (g)meet accountability demands; and (h) meet requirements imposed by licensing and accreditation.

Once the evaluation purposes are specified, **evaluation objectives** can be written. These objectives ask questions about the course or program in order to operationalize the intent of each evaluation purpose.

Step 2. Identify Sources of Information

In order to acquire relevant and accurate information, primary sources are identified. The following five sources, along with the records they maintain, can provide accurate information associated with their roles and responsibilities.

1. **Managers** — Information on goals, trainee recruitment, instructor proficiency, and trainee services including graduate placement
2. **Training specialists** — Information on planning, developing, delivering, and evaluating training
3. **Trainees** — Perceptions concerning instruction and trainee services
4. **Supervisors** — Information on trainee on-the-job performance
5. **Advisory committees** — Advice on the need for and relevance of the training

Step 3. Identify Information Collection Methods

Evaluation has been described as an information-gathering and decision-making process. Unfortunately, the process suffers from the following problems:

1. **Lack of information** — In the absence of accurate and complete information, decisions are often based on opinions influenced by unsolicited or anecdotal comments.
2. **Bad information** — Decisions are sometimes made based on inappropriate, irrelevant, or unreliable information.
3. **Untimely information** — The most sophisticated evaluation is useless if decision-makers are not provided what they need when it is needed.

These three problems can be minimized by carefully identifying information sources and collection methods consistent with the evaluation objectives.

Step 4. Prepare an Activities Schedule

A scheduling worksheet can identify the evaluation activities to be conducted along with the person(s) responsible and the target dates for beginning and completing each activity.

Step 5. Obtain Management Approval

One of the most important steps in developing an evaluation plan is to involve management. Consequently, the plan is shared with appropriate managers at various levels both during and after its development. Training improvement requires more than just management's approval and endorsement — it requires their commitment and a sense of ownership, as well.

Phase 3 — Collect and Analyze Data

When the primary purpose of training is to develop knowledge and skills, evaluation should be attempted at that level. However, if the purpose is personal growth, participants' reactions to training may provide sufficient information. Nevertheless, as Zenger and Hargis (1982) pointed out, the use of **reaction sheets** (questionnaires) falls short on rigor because "participants have a tendency to report what [they think] a trainer wants to hear" (p. 11). Furthermore, the quality of participants' reaction information varies widely and provides no obvious link to performance goals (Zenger & Hargis, 1982, p. 11).

The following guidelines are useful when attempting to improve "rigor" in reaction questionnaires.

1. Ask questions that trainees are qualified to answer. Identify operational characteristics of a course or program and ask trainees if they have witnessed those characteristics.
2. Decide what factors should be addressed, e.g., learning objectives, instructional and practice time, quality of instructional materials, trainee involvement, quality of instruction, and so forth.
3. Keep statements and questions simple.
4. Ask for a written comment to support responses.
5. Collect feedback at an appropriate time (some weeks after the course or program was completed).

Follow-up Instruments

Typically, behavior (application of knowledge and skill) on the job is measured with follow-up evaluation instruments completed by graduates and their supervisors. To increase "rigor" in follow-up evaluation efforts, administer the instrument 4 to 6 months after training.

Supervisors are an excellent source of information regarding both employees' capabilities and training program effectiveness. They are qualified to (a) rate individual job performance, (b) describe common performance problems, and (c) identify anticipated changes in job requirements. Supervisors should be interviewed periodically as to how well training is preparing new employees to perform their jobs. The following types of questions can be used to collect supervisors' responses:

1. How well do graduates perform on the job?
2. For what tasks were they **not** adequately prepared?
3. How do recent graduates compare with those trained earlier?
4. What additional training is needed to maximize employee effectiveness?
5. Do you anticipate any equipment changes which will require different training?

Evaluation Strategies

Bakken and Bernstein (1982) raise two very appropriate questions in the following quote.

> In many cases, one of the objectives of training is to have impact on the organization. Thus, individuals and organizations are expected to change as a result of some training program. Assessing the impact of training on either individuals or organizations raises two specific questions. The questions: Has a change actually occurred? Are any changes that have occurred actually the result of training? (p. 44)

The first question is often answered by the use of evaluation strategies which emphasize the before-and-after measurement of knowledge and skills. The comparison of scores is useful in determining whether changes (gains) have occurred. However, it is not as useful as determining whether the changes were a result of the training.

The second question is usually answered by the use of a control group which is not exposed to the training. Changes occurring in only the test group provide a good indication that the training was responsible.

Phase 4 — Prepare an Evaluation Report

The reporting of evaluation results is sometimes considered a nonessential activity, especially when the evaluator is involved in the decision-making process. However, unless evaluation procedures, conclusions, and recommendations are documented, their credibility and survivability will be at risk. Additionally, the evaluation report provides a useful document for a variety of individuals involved in improving training.

The preparation of an evaluation report should be a straightforward process with a given purpose and scope. In other words, the report should reflect the original evaluation plan. The following statements serve as a checklist for assuring the adequacy of the report.

☐ 1. The purposes and objectives of the evaluation are provided.
☐ 2. All evaluation objectives are addressed.
☐ 3. Evaluation activities are described.
☐ 4. Tables, figures, and other graphic means are used to present data.
☐ 5. Findings are based on sufficient data.
☐ 6. Conclusions are based on findings.
☐ 7. Recommendations are based on findings and conclusions.
☐ 8. Material is presented in a factual manner.
☐ 9. The writing style is direct and the wording concise.

Training may "fail" because of unclear objectives, or lack of job preparation emphasis, e.g., inappropriate content and instructional methodology. In addition, organizational constraints may prevent the use of the skills on the job. Therefore, it is critical to develop an action plan to correct discrepancies identified through the course/program evaluation.

The importance of the action plan cannot be overemphasized. **Vocational course/program refinement or change is achieved only through action**. It is not enough to identify a problem and its cause. Training personnel must determine what findings are significant and develop action items that promote the needed corrective action.

Action plans should specify not only what is to be done, but also who should do it and when it should be done. Someone in the training organization should track and monitor the activities to ensure that (a) they are carried out as planned and (b) changes to the training courses/programs are consistent with the evaluation recommendations.

By systematically seeking feedback, analyzing it logically, and devising realistic and practical solutions, course/program improvement can indeed be an intrinsic and ongoing part of the training effort.

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Finding New Strategies for Post-16 Education to Promote Parity of Esteem between Vocational and General/Academic Education by Networking in Seven European Countries

"Post-16 Strategies"

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Abstract

The Post-16 Strategies project attempts to solve some problems involved in the European vocational education policy goal of raising the quality and innovation capacity of the participating countries' vocational training systems with a view to improving the attractiveness of initial vocational education. An attempt was made to capture the European dimension of vocational education by examining and comparing the peculiar characteristics of upper secondary education reform strategies adopted in six EU member states and Norway to enhance the parity of esteem between vocational and academic/general learning. Shared concepts and themes, examined country by country and strategy by strategy, offered another road to an understanding and a definition of this diversity. Eight upper secondary education systems yielded four hypothetically identified strategies for developing initial vocational education: (1) Vocational Enhancement, (2) Mutual Enrichment, (3) Linkages and (4) Unification.

Purpose

The Post-16 Strategies project has arisen from the current challenges to the development of the transparency and recognizability of European educational systems. Comprehensive development, such as this, with the goal of increasing the appreciation for and appeal of vocational education, is a strategy by nature. Kämäräinen (1996) has defined a number of alternative strategies for parity of esteem between general/academic and vocational education in Europe. The different strategies for existing post-16-education systems are reconsidered against the current reforms in seven countries.

The purpose of the project was to examine and compare the reforms and upper-secondary education strategies being applied in the upper secondary education of six EU member states and Norway. Cooperation with and study visits to (pilot) schools are among the means used to evaluate how far the reforms and strategies being implemented in each country are being realized in educational institutions so as to improve the attractiveness of vocational education. The project has created national and European cooperation networks between schools, teachers, administrators and researchers.

The project will be carried out in two phases, as surveys and as analyses. The aim of the first or survey phase was to outline the status of secondary-level initial vocational education and sketch out problems linked with the attractiveness of vocational education and the parity of esteem between vocational and general learning. On the basis of the material collected in the interim phase, the project was attempting to answer the question: What upper secondary education strategies are being applied in eight European educational systems?

Political and Practical Basis for the Post-16 Strategies Project

The goal of the Leonardo da Vinci programme is the promotion and encouragement of the quality and innovative capacity of national vocational schools with a view to raising European educational and skill levels and guaranteeing life-long learning facilities. Vocational basic and continuing education are not separate stages in the development of an individual but form an ongoing educational process involving adaptation to working life and the development of personal and occupational identity. According to Valkama (1991), historically the educational means used to achieve a qualification level can be distinguished as different strategies, from the expansion of upper secondary education to the establishment of adult education and, in the end, to restructuring the education of a generation into life-long education.

Post-16 education including initial vocational training is primarily defined as upper-secondary-level education. Initial vocational education and training covers initial technical and vocational training and systems of apprenticeship that enable young people to gain a recognized vocational qualification. Initial vocational education and training is formal education delivered through programmes that are publicly financed and that prepare individuals for employment in current or emerging occupations. Certificates or diplomas are granted to programme completers, and graduates can often proceed to higher levels of education.

Bringing the concept of innovation to educational systems leads to educational modernization, to reform. Innovations are created and innovative capacities developed through national cooperative networks on the one hand and through international cooperation on the other. This makes possible the cooperative exploitation of a rich global, European, national and local experiential base (Green Paper on Innovation, 1995). During the last few decades, the innovations introduced into academic/general education have been more moderate in their effects that those carried out in vocational education.

A vocational education reform is often tied to a variety of social and cultural developments (Van Den Berg & Vandenberghe, 1986). Reforms facilitate the realization of national educational policies and goals. Also, an educational reform is often realized at many levels, involving administration, educational structures and curricula. Political, social and economic factors play a significant role in the assessment of reforms.

There are two traditions in how the concept of vocational education is understood. According to Lauglo (1993), in addition to training in vocational skills vocational education also includes general education; broad-ranging human growth is valued. Training is mainly concerned with skills needed in the targeted tasks and work situations included in a given job, which is also the goal of the general education component incorporated into vocational education. The training approach underlines values related to increasing the productivity of work, but training can also mean know-how that can be transferred and applied to situations other than the targeted job tasks. An example of this would be professional ethics. Although the term education is also used in vocational education, as is the case in Scandinavia, the profound role that vocational education plays in the education and growth of an individual into an autonomous citizen has not generally been problematised, with the exception of the certain pedagogical approaches developed in Germany.

The purpose of networks between vocational and academic/general education and working life is the enrichment of vocational and academic/general education programmes through mutual cooperation. Cooperation may involve various educational establishments and their teachers and students. The starting point is equal esteem for different learning contents. While we incorporate general contents into vocational programmes we should ask ourselves whether academic/general programmes in turn lack vocational elements.

Educational networks refer to connections with the world of work for which they prepare students. Formal training programmes do not necessarily have strong links to employers with the exception of the German and

Austrian dual systems and apprentice training schemes. According to Herschbach, Hays and Evans (1992), training programmes that include work experience components are better able to adjust to labour market needs. Training programmes also give employers a chance to get to know their future employees and find out what they are like. Even though the Finnish vocational education system, unlike the German and Austrian systems, does not engage in direct daily collaboration with employers, vocational education and training has been organized in a versatile way. In addition to participating, during their 2- to 3-year vocational secondary and tertiary education, in 6-12 months of practical training, Finnish students have at their educational establishments access to training facilities with tools, materials and customers that resemble those present in real-life situations. Finland has invested substantial funds in vocational education, an indication of the esteem accorded to vocational education.

Methods and Procedures

The Post-16 Strategies project surveys and analyses strategies for school reforms, whether completed or underway, whose aim is enhancing the attractiveness of vocational education. The interim data of the project consist of existing national documents, expert assessments and the written material produced during the process of implementing the project. The partners collaborating in the project represent a broad range of expertise: the researchers examine the subject from a multidisciplinary perspective, and their views are complemented by those of school administrators, decision-makers and teacher educators.

The project has proceeded in the form of (a) joint seminars where the European partners present papers based on their expertise and earlier studies, and where a corpus of shared material is assembled; and of (b) reciprocal visits by representatives of pilot schools operating in partner countries to establish exchange linkages. Round-table discussions during the workshops have helped the collaborators to make comparisons and draw conclusions.

The procedure chosen for carrying out the project is that of a structured collaborative writing process where an interdisciplinary and international team of experts works out the results of its analysis of vocational education in and through writing. The process advances in stages according to tasks agreed upon together. The project also applies an expert assessment model.

The collaborative writing process is viewed as a way of knowing and learning to know through writing (Beard & Rymer, 1990). This entails the hypothesis that knowledge of vocational education emerges in social interaction. Thus, writing is not just a private cognitive process and the production of text but also social action. Learning through collaborative writing is more a collaborative social endeavour than competition between the participants. As a result of their work, the experts who cooperate through collaborative writing help outsiders to understand the social dimensions of phenomena, which results in the production of new knowledge.

Interim Findings

European countries have their characteristic national systems of vocational education and training, within which the status of vocational education varies. The Post-16 Education project attempted to capture the European dimension of vocational education by describing the peculiar characteristics of different strategies used in European countries to improve the parity of esteem between vocational and general/academic education. Shared concepts and themes, examined country by country and strategy by strategy, offered another road to an understanding and a definition of this diversity. Eight upper secondary education systems yielded four hypothetically identified strategies for developing initial vocational education: (1) Vocational Enhancement, (2) Mutual Enrichment, (3) Linkages and (4) Unification. Although the four strategies are not pure types, and developments in most countries include examples of more than one strategy, they have served as an analytic tool for studying current reform measures (Raffe, 1996).

Vocational Enhancement. This strategy emphasizes the distinctive nature of vocational education on the basis of its characteristic content. Esteem for vocational education is linked with the standard of the content and pedagogy of vocational education and training. German and Austrian reforms are based on a belief that vocational training can also provide a path to higher education qualifications through the incorporation of optional general education components into vocational programmes (Birke et al., 1996; Bremer & Heidegger, 1996).

Mutual Enrichment. In Finnish and Norwegian reforms vocational education institutions and general upper secondary schools cooperate with the aim of giving students more choices and stimulating learning environments. The strategy brings different school forms closer through cooperation while preserving their distinctive character. An increased margin of choice is also believed to increase esteem for vocational education and enhance the motivation of vocational students. The Norwegian and Finnish strategies aim to maintain a distinct identity for vocational and general education (Numminen & Virolainen, 1996; Andersen, 1996).

Linkages. Countries representing this strategy have made vocational and general education formally equal by linking both to a common qualification structure. Educational systems that traditionally fostered elitism by emphasizing academic studies attempt to make vocational education equal in status to general education using this reform strategy. Reforms in England and France emphasize similarities between vocational and general education (Levrat & Lazar, 1996; Young & Spours, 1996).

Unification. Under this strategy vocational and general education have merged into one another until they make up a uniform upper-secondary-level educational system. It is believed that requiring all students to study certain common general subjects will provide them with equal opportunities to engage in further studies, a factor that determines the attractiveness of different qualifications. Sweden and Scotland represent unified systems where the aim is to abolish the distinction between vocational and general learning (Arnman, 1996; Murray, 1996; Raffe, 1996).

To analyse the four vocational education reform strategies the partners outlined such common themes in the development of curricula and study programmes as networking, flexibility of choices and qualifications, cooperation among teachers and links between school and working life. Reform issues of this kind were manifested in different ways in the educational reform processes and strategies of different countries. In addition to being characterized on a national level, the issues were also compared across different countries.

The analytic phase of the project started with the collaborative writing process whose aim is comparing and reviewing the four reform strategies for parity of esteem linked with the partners' eight post-16 education systems. Practitioners' cross-national study visits to pilot schools will contribute to designing future exchange programmes.

Implications and Recommendations

The impacts and innovations of the Post-16 Education project derive from its aim to assess, on the basis of the results of country comparisons, to what extent the strategies chosen to bring about upper secondary education reforms have succeeded in enhancing the esteem accorded to vocational education and what are the preconditions of their success. Country comparisons will be tentatively used to outline

1. European strategies for reforms of the mutual relations between vocational and general education;

2. models describing the goals of theoretical and practical instruction and of school-based and work-based instruction; and
3. how esteem for vocational education may be enhanced by means of study programmes, qualifications and teacher cooperation between local schools.

The project further aims to create learning links between researchers, administrative personnel and teachers and representatives of schools. It is hoped that such links will help to create new experimental and developmental projects and enrich existing projects with developmental results and research findings contributed by the partners.

The project sees educational policy makers, researchers, teacher educators, teachers and administrators as the main target groups of its impacts and innovation dissemination activities. Students, who should benefit from the results of the project through educators, will comprise the final target group.

The focus of the transfer may be on applications and on testing the findings of the project and/or on actual practices. The project both develops further already existing innovations linked with the national reforms and creates new ones through national cooperative networks on the one hand and through international cooperation on the other .

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PART II

INTERRELATIONSHIPS BETWEEN THE ROLE AND RESPONSIBILITIES OF WORKING LIFE AND VOCATIONAL EDUCATION AND TRAINING

Bildung through Vocational Education[1]

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Abstract

The division between vocational and academic education has its roots deep in European history. In the very heart of this division is the German concept "*Bildung*". The basic idea behind *Bildung* is that one must make oneself into something worthwhile through one's own efforts. The development of an individual is thus seen as a process of becoming an educated person through one's own actions. The idea of *Bildung* has opened up at least three different routes to worthiness: the acquisition of *Bildung* through religion, through science and scholarship and through a vocation.

The well-known slogan "*Bildung durch Wissenschaft*", *Bildung* through science and scholarship, described the effort to escape the constraints of the Church and expressed a belief in individuals' own ability to cultivate their minds. "University" was at the very beginning a student community and "*Studium*" a name for places where scholars' corporations resided. "*Studium generale*" meant that the content of their studies went beyond narrow local concerns. The division between academic and vocational studies was a question of privileges and power. The result of all this was that today we see academic *Bildung* as absolute, truthful and general, above any particular interests, and vocational *Bildung* as relative, instrumental, limited to specific concerns and tied up with particular interests.

The differentiation between academic and vocational education is a very essential aspect of European tradition and it is therefore impossible

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to overcome it through one type of education getting the upper hand, through the supremacy of one or the other, irrespective of whether it would entail the scientification of vocational education or the vocationalization of academic education. The mission is instead to create a new kind of interdependency between the two traditions so that we are able to generate a process of mutual enrichment.

Bildung

The German concept *'Bildung'*, perhaps akin to the English word "cultivation", is almost impossible to translate into English. In it we have two words, image and tilling, put together to form a possibility of seeing the development of an individual as a process of becoming educated person through one's own activities and deeds.

Bildung is always linked to some aspiration. Originally the intention expressed by the concept was cutting oneself off from this world and preparing for eternity. The basic idea behind *Bildung* is apparent here: one must make oneself into something worthwhile through one's own efforts. The idea of *Bildung* has opened up at least three different routes to worthiness: the acquisition of *Bildung* through religion, *Bildung* through science and scholarship or *Bildung* through a vocation.

A cultural interpretation of the concept advocates classical *Bildung* and the virtues expressed in it. However, although the descriptions of "free man" are attractive and well-founded, they involve two problems: they portray a free man who realizes his freedom by means of the work of non-free people, i.e. slaves and women. Also, if one was not fated to have freedom and enjoy civilized culture, one could not achieve it. In the Middle Ages *Bildung* gained a new, more optimistic starting point: everyone could acquire it through religion. Every person had to educate himself / herself in order to be acceptable to God.

The Myth of the *Academe*

The well-known slogan *"Bildung durch Wissenschaft"*, *Bildung* through science and scholarship, described the effort to escape the constraints of the Church and expressed a belief in individuals' own ability to cultivate their minds. This slogan was based on individualism, perhaps even on the idea of aesthetic individualism: man must put himself in God's place. Science became a new secular church with its accompanying institutions.

As we know, presenting Platos's suburban school at "the olive grove of Academe" as the origin of universities is a myth manufactured by the university scholars.[2] The university of Bologna - to take an example - was a student community *(universitas scholarium)* for legal studies in the middle of the 12th century. Its students, coming from all over Europe, were "aliens but highly desirable ones as they bought with them a promise of fame for the city and prospects of income increase for its citizens (house rent)"[3]. The student community was eager to gain political and economic privileges. According to Roman civil law, a community is a corporate personality with a set of rights and obligations, but as legal aliens the students were only artificially citizens of the city. In such a position, aspiring privileges denied the apprentices of crafts and trades of the city, really required a "masterpiece of juridical sophistication" . ... "The ancient imagery of a knowledge hierarchy with the *artes liberales* on its higher levels and the *artes serviles* on the bottom line was reanimated by the 13th century jurists of Bologna for practical and political reasons."[4]

'Universitas' was, then, at the very beginning a community of students while *'Studium'* was a name for places where scholars' corporations resided. *'Studium generale'* meant that the content of their studies went beyond narrow local concerns. The division between academic and vocational studies was a question of privileges and power. The result of all this was that academic *Bildung* was seen easily as absolute, truthful and general, above any particular interests. This is also an excellent basis on which to insert academic *Bildung* in the glory of national truth, as was done in many countries later on.

Vocational education, by contrast, was relative, instrumental, specific and tied up with particular interests, because it was related to working life and its basic nature was not national but international. When later on the differentiation between Art/Fine Art (*Kunst/Schöne Kunst*) was established to give art and art education the social prestige of a science, *ars serviles* lost also the idea of aesthetics. The theory of knowledge and theory of beauty are for social reasons detached from the theory of *Techne*. After these operations we can go on to talk about the training/formation the skills of the labourer. Academic Bildung, then, expresses not a general but a particular social interest - a call for power.

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[2] See A Dabrowski 1990

[3] Dabrowski 1990

[4] Dabrowski 1990

Vocatio

Another call has been heard in the history of education - the call for a profession. Although even here the starting point has often been the individual's preparation for eternal life, this call has also been associated with a bond with other people: it is possible to make oneself worthy through other people by making oneself indispensable in the eyes of others. Here *Bildung* thus means becoming worthy in the estimation of other people, not only in one's own estimation. *Vocatio*n has become a pro*fession*.[5]

This road to *Bildung* differs in its intention from the road to academic *Bildung*. Traditionally academic *Bildung* seeks to escape from the world and distance itself from it, so that the world can thus be seen more clearly, i.e. more truly. Ultimately the aim is to write a great enlightening book about the world, to recreate the world - and to rise above the hurly-burly of one's own restless era.

A profession, too, is always linked to an aspiration: the desire to make things and even people to take on a new form. A profession is not related to the idea of escaping the world; rather, a profession requires going out into the world: the essence of the world can be learned only by working on and with it. A profession makes it possible to create one's own durable internal world, which also involves other people, as a source of *Bildung* - i.e. freedom - not as a barrier to it.

It is a long journey from being a master in a medieval guild, from the "nobility of the common man", to modern-day professions. Nor will society any longer open up as an organic whole in which each person can work for the good of all as its differentiated cell. Vocation has increasingly become a job, a work task. Each individual bond with the whole has been transferred outside the work of the profession, to be mediated in public, in a public domain. This public domain is not our own creation either but, rather packaged publicity, an image of ourselves.

It need not be so. As professionals we all find ourselves confronted with the conflict between our own work and the basic problems of our era: how should I solve the problems I face in own work if I look at themes, for instance, as a parent, a citizen or a human being, not just as a employee. What solutions emerge for my examination when I consider my professional problems from all these angles? The motives involved in our work are clearly expanding beyond the boundaries of our various occupations.

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[5] In English we have an interesting difference between 'vocation' and 'profession'. *Vocatio*-n means that somebody is calling you, but pro-*fession* that you are working on the basis of your own confession. The German word *"Beruf"* means also a calling. When I use the word "profession" here, I do not mean that I am ignoring occupations or vocations.

Bildung Through Vocational Education: The Strategy of Mutual Enrichment

The differentiation between academic and vocational education is very essential aspect of European tradition and it is therefore impossible to overcome it through one type of education getting the upper hand, through the supremacy of the one or the other, irrespective of whether it would entail the scientification of vocational education or the vocationalization of academic education. The mission is instead to create a new kind of interdependency between the two traditions so that we are able to generate a process of mutual enrichment.[6]

As we saw earlier, the very basic roots of the differentiation between academic and vocational education have been formed in classical Antiquity, but the Reformation, the birth of labour markets, the role of the state in the process of formation of (civil)society have all contributed to determining how important and central the differentiation of vocational and academic education has been as an influence on the structure of European educational systems.

Traditionally there has been a strong association between academic education and knowledge and competencies related to life outside work, that is, the public life of a gentleman or a citizen. The work of a craftsman and the vocational tradition have been much more closely associated with skills belonging to working. When we discuss the differentiation between vocational and academic education, we are at the same time discussing about the differentiation between citizenship and labourer/worker.

The Anglo-American tradition sees the very position of a citizen in the terms of the market place, and after the war the whole concept of citizen has been reformed from the point of view of the social state, which partly excludes questions linked with working life.[7] In the German tradition the basic position of citizenship is represented by that of the traditional craftsman citizen. The concept of citizenship is in its very basis an expression of community, of a shared house, not of the marketplace. This means that the idea of the social state has not led to a purely market-based idea of citizenship; rather, the community has developed in the direction of society while still retaining some features of the traditional community, as is seen in the German system of vocational education.

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[6] Mutual enrichment is one of the four strategies of establishing a new relationship between academic and vocational education in upper secondary education in Europe. See Lasonen 1996.

[7] See discussion on Marshall in Turner, 1995.

In the history of the birth of labour markets in Europe we can see at least two very different kinds of mainstream: ’vocationalization from above’ (Germany, France) and ’vocationalization from below’ (England).[8] In the first case the state has exerted a very strong impact on the construction of labour market, the occupations and vocational education. In the second case market processes haven been more decisive.

In the Nordic countries, at least in Finland, Sweden and Norway, we have some peculiar combination of these two pairs of distinctions: characteristically vocationalization from above together with the central planning of vocational education and labour market has been quite a strong feature of Nordic societies, but at same time citizenship is understood in terms of the labour market and the state. This is possible only under the assumption that society is generated by the state to ensure general welfare. However, today the differentiation of state and society is a powerful trend in the Nordic countries.

We can, then, see three educational systems emerges from these two differentiations: vocationalization from above vs. vocationalization from below and market-based vs. community-based society as the historical basis of citizenship (see Table 1).

Table 1. *Vocational Education and Citizenship*

	The basis of citizenship	
Vocationalization	community society	market society
from below	**D** Learning society ??	**B** England On-the-job ed.
from above	**A** Germany Dual ed.	**C** Nordic School-based ed.

My hypothesis is that to be able to approach the "learning society"[9] (D) all these three approaches (A, B, C) require a chance of the relationship between vocational and academic education because of the following trends in the working and social life

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[8] Siegrist, 1990, Konttinen, 1991. I use here the theory of professionalization supposing that the differentiation between ’from above’ and ’from below’ is applicable also to other occupations.

[9] The "Learning society" -idea was used by Torsten Husén already in '70, but discussion in Europe is nowadays stimulated by the White Paper of EU. See The White Paper on Education and Training, 1995.

1. The idea of "learning society" implies that the process of reflection, some forms of learning is indispensable in all social activities.
2. The production and work process must be opened to learning. This is a life and death question to production units.
3. New production concepts/models question the traditional differentiation between citizenship and worker/labourer: every worker is more or less required to work as a citizen.
4. Open and complex working situations, impossible to prepare for beforehand by issuing rules and directives, are ever more common. More versatile skills and more broad-based knowledge - concrete *and* general skills and knowledge - are needed to handle such situations.
5. Vocational competence means the ability to increase the productivity of and the quality of the products made by the production unit. An increasingly important question is how concrete and rich concept is the of "productivity" that we are using (does it also embrace also the questions involved in environmental, social and human capital).

We can see that the measure of *Bildung* is currently being defined in a new way. Alongside the measure of national *Bildung* comes a time-related qualifier. The yardstick of *Bildung* is linked to its ability to define and solve the basic problems of our age. Let it be added - for the sake of clarity - that of course this also requires knowledge of other ages in order to shed cross-light on our own age. Ultimately it is a question of how we should implement practical humanism and fully matured *Bildung*. The goals, significance and meaningfulness of human activity on the one hand and the tools for implementing that activity on the other should not be separated from each other, nor should people be cut off from each other on this basis.

The reality of *Bildung*, its link with life on earth is in the last analysis decided through work in an occupation. The era-relatedness of a *Bildung* is apparent in its ability to live in the global village, to see a period and its problems here and now. Working in an occupation is one area of *Bildung* where those problems are settled for us all if only we have the ability and the freedom to perceive and read them in our everyday life. This in turn requires a fully matured *Bildung* and fully empowered citizenship - also at work.

The Bottom Line: Vocational *Bildung* as Modern *Bildung*

What was then the basis of the differentiation of *ars liberal* and *ars serviles*? It goes as follows: When you are forming, through a working process (*poiesis*) the object of your work, you cannot reform yourself, and when you are forming yourself through activity (*praksis*) you are not forming a separate object outside you but yourself.

In fact, it was one of the starting points of the modern times to say that you can - in principle and in a philosophical sense - educate yourself through work. It means that in principle and in a very fundamental sense vocational *Bildung* is modern *Bildung*. The academic tradition was shocked to realize this fact during the two first decades of this century. And now, when this "discovery" is a part of our everyday life, the academic tradition produces a view of post-modern: the loss of the hope to find once more "the olive grove of Academe". Perhaps the post-modern *Bildung* is education with "general education within the vocational medium"[10] ?

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Joint Venture Partnerships between Vocational Education and Training, and Businesses

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Abstract

Joint venture partnerships are voluntary linkages between vocational education and training (VET) programs and private or public sector employers. They combine the energies and resources of the partners to promote joint interests including improvements in the relevance, effectiveness, and efficiency of VET programs.

Joint venture partnerships are appealing to employers because of their simplicity, flexibility, manageability, and limited commitment of resources. They are especially appropriate when employers are not ready to fully participate in a highly structured and somewhat costly youth apprenticeship effort, but are interested in other cooperative undertakings.

Introduction

Joint venture partnerships are voluntary linkages between vocational education and training (VET) programs and private or public sector employers. They combine the energies and resources of the partners to promote joint interests including improvements in the relevance, effectiveness, and efficiency of VET programs.

Joint venture partnerships augment the efforts of advisory committees through collaborative visionary initiatives that facilitate greater business and community involvement in support of public VET. This one-to-one pairing enables businesses to support programs in direct and concrete ways. Factories, contractors, retail stores, hospitals, government agencies, unions, trade/agricultural associations, community organizations, service clubs, and so forth can all be effective partners.

Joint venture partnerships are appealing to employers because of their simplicity, flexibility, manageability, and limited commitment of resources. They are especially appropriate when employers are not ready to fully participate in a highly structured and somewhat costly youth apprenticeship effort, but are interested in other cooperative undertakings.

Establishing a Joint Venture Partnership

After the VET program and business get to know each other and their discussions have matured to the point where they verbally express an interest in forming a joint venture partnership, a **memorandum of understanding** is drafted to formalize the arrangement. The memorandum of understanding, which is typically two to three pages in length, (a) describes who the partners are, (b) lists their joint interests, (c) provides a rationale for the partnership, and (d) specifies the terms and conditions of participation. This memorandum takes effect on the date signed by both parties, is periodically reviewed, may be modified by mutual agreement at any time, and remains in effect until rescinded by either party.

The list of joint interests included in the memorandum is used by the partners to guide their efforts in preparing a **plan-of-work**. The plan-of-work, which is often prepared on an annual basis, identifies agreed-upon undertakings, along with a milestone chart (timetable for completion/accomplishment), the person(s) responsible for action, resource requirements, and so forth. The memorandum of understanding, along with the first plan-of-work, is then approved and signed by dignitaries representing both partners. When the signing is performed during a formal ceremony at a business, school board, or community meeting, there is complete public disclosure and the likelihood of favourable publicity.

Collaborative Undertakings

Partnership undertakings vary from short-term activities to involved long-term projects, depending on mutual interests, needs, resources, and the size of the business or vocational program. Examples include, but are not limited to, the following possibilities:

1. Collaboration in designing, developing, delivering, and evaluating instructional programs

2. Development of skill standards and certification requirements which reflect state-of-the-art technology and practices
3. Career exploration opportunities, such as field trips and worker shadowing
4. Classes for students at business sites
5. Internships and other forms of student work experiences
6. Shop or classroom speakers
7. Assistance with tutoring and performance testing
8. Seminars on job readiness (work attitudes, interpersonal skills, etc.)
9. Recognition (certificates, plaques, and other awards) for student achievements at graduation and other appropriate events
10. Professional development activities for both partners
11. Executives-on-loan to assist in school operations
12. Exchange programs for instructors and other school personnel

These are but a few of the many activities and projects that can be undertaken.

Through the cumulative effect of such collaborative efforts, joint venture partnerships will improve the learning environment at a school. Mature partnerships seek to emphasize curriculum, student, and staff development initiatives, rather than token involvement limited to requests for and contributions of money.

The School Perspective

A joint venture partnership can provide many benefits for a school, but most importantly, it serves as a mechanism for bringing the "outside world of work" into direct and frequent contact with students and instructors. This outside contact means a broader audience for positive school efforts, an exchange of ideas, a better understanding of other viewpoints, and the chance to be better understood. It can also offer contacts to draw on in meeting future needs and an opportunity to make the VET process more relevant and accountable to community employers.

Outside contacts can lead to increased student motivation to stay in school and learn, with greater awareness of work-world opportunities and expectations. Furthermore, because public schools directly serve only a small percentage of the tax-paying households in their communities, joint venture partnerships can help to reduce the isolation from the broader community that provides much of the financial support.

The Business Perspective

Businesses are increasingly becoming willing partners to joint venture agreements because they know that it is a **good way to ensure a reliable supply of well-trained workers with positive work habits**. They are beginning to realize that VET programs are important suppliers of human capital and ought to be dealt with as they deal with other suppliers — getting involved and collaborating on quality and quantity requirements.

More specifically, the decision to become involved often includes the following economic self-interests and social responsibility motives which make business sense.

1. Well-trained workers are more versatile and productive, can more readily solve work-related problems, and are necessary in order to increase a business's competitiveness and profitability.
2. The opportunity to observe and evaluate students over a period of time, under work conditions, before making job offers, reduces the costs and risks of recruiting, screening, and hiring skilled workers. To the extent that they are active in the development of knowledge, skills, and attitudes, businesses can also be assured of students' abilities and attitude.
3. Participation means good standing in the community and shows a social responsibility to help the young generation.
4. The lack of voluntary involvement could lead to government intervention which invariably increases costs and paperwork while reducing private and local control. Consequently, a joint venture partnership can be viewed as a **prudent business investment with long-term economic and social returns**.

Benefits for Vocational Education and Training Programs

What joint ventures can offer varies widely, and might include

- A broadened base of support for VET
- Guidance and assistance in (a) identifying and developing the skills needed for employment, and (b) job placement

- Work experience for students
- Technical upgrading and updating for instructors through personnel exchanges, work experiences, participation in company training programs, attendance at seminars and/or workshops, and expert assistance in the classroom and shop
- Assistance in updating and upgrading VET programs, equipment, and facilities
- Increased contacts with employers to consider, among other things, the viability of alternative delivery schemes, i.e., cooperative education, school-to-work, and apprenticeship programs for young adults

Benefits for Employers

Employers can have widely varying reasons for their interest in a joint venture partnership. Some may have existing or projected worker shortages in certain skill areas, while others see some advantage in community involvement. The following is a selected list of potential benefits.

- An opportunity to contribute directly to relevant programs, thereby eliminating skilled worker shortfalls
- Programmatic changes consistent with employer expectations
- Long-term improvements in the work-readiness and productivity of qualified entry-level workers
- Supplemental training for workers in reading, writing, listening, speaking, reasoning, applied science and mathematics, and manual skills
- Improved community relations through enhanced visibility and recognition for valued public service

Benefits for the General Public

- Improved understanding and cooperation between and among key elements of the community

- Stimulation for other cooperative efforts within the community to do what's needed and what's right for young adults
- Realization of the community's impact on the relevance and quality of public school programs
- Voluntary staff and student labor on community projects, such as the maintenance and beautification of public facilities and grounds
- Increased involvement in youth activities/clubs
- An improved economic climate for business through a vital and healthy VET system

In Conclusion

Joint venture partnerships foster special bonds of cooperation and mutual respect between schools and the communities they serve. They offer businesses a path of involvement in VET based on mutually acceptable graduated levels of commitment. For schools, they are the means by which VET programs can benefit from local resources and talents. Ultimately, joint venture partnerships serve the interests of students, schools, businesses, and the community as a whole.

Three elements are necessary to form a joint venture partnership: (a) the endorsement of school district officials and, possibly, the board of education; (b) support from businesses and/or community leaders; and (c) someone with energy, expertise, and time to initiate the effort and keep it moving forward.

An Evaluation of the Reform of Finnish Upper Secondary Vocational Education Curriculum: The Perspective of Individualization and Personally Constructed Study Programmes

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Abstract

The structure of and the diplomas awarded in Finnish vocational education were reformed in autumn 1995. To find out how the curriculum reform has been implemented in practice the National Board of Education commissioned a study by the Institute for Educational Research. It examined different study fields in Finnish upper secondary vocational education and the most common diplomas awarded after the completion of such studies. The data were collected with the aim of charting the views held, on different levels of Finnish vocational education institutions, by principals, teachers and students. The questionnaire was returned by 2,233 students, 644 teachers and 118 principals. The follow-up and evaluation of the new curricula were carried out as a survey in autumn 1996. The evaluation was based on only an years' experiences from the curriculum reform.

Introduction and Purpose

The structure of and the diplomas awarded in Finnish vocational education were reformed in autumn 1995. The reform was an attempt to meet the challenge of the rapid changes occurring in occupational competencies, technology, work organisations and of internationalisation and the high unemployment figures. In connection with the structural reform the national principles on which the curricula of the various diplomas are based were also reformed. The Finnish vocational education curriculum system consists of the national core curricula and curricula of individual educational institutions. The national core curricula, specified separately for each study field and qualification, are approved by the National Board of Education (Opetushallitus, 1996).

One of the goals of the vocational education curriculum reform was improving and diversifying study methods and stimulating school- and college-level development work. In addition, today's conception of learning emphasizes that the student actively constructs, acquires, processes and evaluates his or her own knowledge. This change in study culture makes necessary such new teaching arrangements and practices as student-centred methods and personally constructed study programmes. Both entail taking students' aptitudes, earlier studies and work experience into consideration and allowing students to supplement their studies with courses taught outside their own educational institution. The aim of crediting students for earlier studies is the prevention of unnecessary overlapping of studies.

To find out how the curriculum reform has been implemented in practice the National Board of Education commissioned a study by the Institute for Educational Research. The purpose of the study was to assess how well the reformed curricula have worked out. A further purpose was charting how national curriculum principles serve school and college-level curriculum design and how the goals defined in the principles are realized in the curricula of individual schools and colleges.

Procedures and Methods

The study covers study fields in Finnish upper secondary vocational education and their most common basic diplomas. It is based on a sample of the core population that corresponds to the core population's study field and diploma distribution. The sample was selected by using stratified cluster sampling, with teaching group as the sampling unit. (Malin & Törmäkangas, 1996).

The core population of the study comprised students who in autumn 1995 began their studies for the basic diplomas offered in Finnish secondary-level vocational education for comprehensive school leavers, their teachers and the principals of their educational institutions. The sample included some 3,000 students, 1,000 teachers and 150 principals. The questionnaire was returned by 2,233 students, 644 teachers and 118 principals. The study examines a number of study fields in Finnish upper secondary vocational education: such as the natural resources sector, the technology and transport sector, the administration and commerce sector, the hotel, catering and home economics sector and the cultural sector.

The follow-up and evaluation of the new curricula were carried out as a survey in autumn 1996. The present paper is based on data collected with forms designed for principals, teachers and students (Stenström, 1997). The data were analysed by using cross-tabulation, analysis of variance and factor analysis.

Findings and Conclusions

The findings reveal that a curriculum reform was felt to have been necessary. Principals thought it more necessary than teachers. Principals and teachers judged that the curriculum reform had changed both their own teaching and working methods and students' working methods, as was also called for in the curriculum objectives. A new learning culture had reached different training sectors at a different pace. Even though the reform was felt to have been necessary, in the initial phase of the reform informants were not yet fully convinced of whether it would turn out well; principals and teachers had different opinions about the subject. More than half the principals and a good third of the teachers though that the reform had turned out well. It may be assumed that this answer reflects different perspectives on the reform, those of administrators on the one hand and those of people entrusted with practical implementation on the other.

Informants thought that national curriculum principles had increased students' range of options and schools' and colleges' curricular latitude. Educational establishments offered options mainly from their own teaching. The range of options made available to students was constructed mainly on the basis of each establishment's own core areas of expertise.

Even though most students had the option of taking courses at another educational establishment, about half the respondents said that they were not interested in an opportunity of taking courses in other study fields or at other establishments. The most frequent reasons cited by students for not enrolling for courses in other subjects taught in their own establishment or for courses taught at another establishment was inadequate study guidance, insufficient information about what is available in other educational institutions and long distances between different establishments. From the educational institution's own point of view the introduction of an increased range of choice had been hampered most by timetables, lack of money and small teaching groups. Those who did take courses in other subjects taught at their own establishment or courses offered at another establishment were influenced most by a desire to improve their further education opportunities and to broaden their working-life qualifications and by an interest in the studies chosen.

Increasing students' range of options in the spirit of the reform also requires that students are credited for earlier studies. To find out how well the principle had been put into effect, principals, teachers and students were inquired about the subject. There was no agreement on the matter among the three groups of respondents. Principals thought more often than teachers that the principles on which previous studies were to be credited were common knowledge and that they were also being applied in practice. Most students thought otherwise. According to them the principles on which previous studies were to be credited were not commonly known and students were given no advance information about the substitutability of a given course of study. Personal study programmes that would take substitutive of different studies into account were also lacking. A partial explanation may be that more than half the students had no previous studies that could have been credited. Health and social services students and cultural students had the greatest amount of previous studies.

A central aim of the reformed upper secondary vocational education is carrying out a personal study programme. Examining the subject in the middle of studies does not give an accurate picture of a study programme and its implementation as a whole. From one year's experience students thought that no attention had been paid to individual supervision and guidance, while principals and teachers held the opposite opinion. There were also differences between training sectors. Personal study programmes received least consideration in the natural resources and technology and transportation sectors. There seemed to be more emphasis on them in the commercial sector, the cultural sector and the hotel, catering and home economics sector, even if most respondents thought that personal study programmes had been neglected in these sectors as well.

Altogether an evaluation of the new curricula revealed that different respondent groups had different views about how the reform had been put into effect and how well it had turned out. Principals', teachers' and student's answers to the questions put to them differed in several respects. It was also found that the reform had advanced at a different pace in different sectors of vocational education, depending on whether the educational establishment in question represented a single study field or several study fields and whether it had taken part in earlier educational experiments.

Implications

Because principals and teachers have taken part in designing and implementing the new curricula of their own educational establishments, they are more familiar with the concepts and principles involved in them than students. One year's experiences were not sufficient to give students an overall grasp of the reform and of how study programmes are to be constructed. A contributing factor in their confusion is a lack of personal supervision and of information about the substitutability of a given course of study and about how previous studies were to be credited, both of which will become increasingly important factors in study motivation and progress when students become able to choose for themselves. The evaluation covered a short period of time after the reform had been put into effect; only in several years' time, after students have entered working life or gone on to further studies, will it become possible to draw conclusions about its success or failure.

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A Study on the Feasibility of the Ten-Year Compulsory Education Program in Central Taiwan, Republic of China

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Abstract and Introduction

The Ten-Year Compulsory Education Program (TYCEP) is a present educational reform plan in the technical vocational education system of Taiwan, R.O.C. This study investigates the feasibility of the TYCEP by a quantitative analysis in various respects of the present society in Taiwan, and by utilizing a quantitative analysis of the junior high school third-year students' (on technical and general track respectively) Career Development Inventory, and polls of related high school administrators, faculty, and the project interviewers who are members of the Committee for TYCEP Evaluation, Ministry of Education, R.O.C. Data upon which this study is based were collected through stratified random sampling, and quantitatively analyzed by statistic methods, including frequency, percentage, mean, standard deviation, chi-square analysis, analysis of variance, and Pearson product-moment coefficient of correlation. It was concluded in this study that the TYCEP was found to be positive and affirmative in terms of the eight generalization reached in this study. Based upon these analyses, the researcher proposed seven concrete suggestions for improving the TYCEP.

"Developing and Improving Junior High School Technical Vocational Program - Toward Achieving Ten-Year Compulsory Education Objectives" (henceforth, TYCEP) is an educational reform plan in technical vocational education system of Taiwan, Republic of China. Due to the implementation of this plan, the technical vocational educational system was enriched. Therefore, an empirical study on the feasibility of the Ten-Year

Compulsory Education Program is essential to assess its appropriation or enhancing students' learning.

Purpose of the Research

According to what happened during the year of the implement of TYCEP, this study intends to discuss the appropriateness of this project on the basis of the literature review and the data collected from questionnaires. Specifically, the purpose of this study are the followings.

1. To understand the current situation of the TYCEP.
2. To discuss the factors that influence this project, such as social conditions, economy, education, and students' career development.
3. To analyze the working of TVE in other countries.
4. To conclude the research findings and then provide suggestions to the TYCEP administrative authority.
5. To testify to the appropriateness of TYCEP for the educational reformation.

The Major Concepts of the Research

Education is of the essence to the founding of a country. Whether the education of a country is successful directly affects the ups and downs of that country. American socialist, L.F. Ward (1841-1913), who advocated social telesis, firmly believed that education is a way to promote social advancement. He maintained that education is the main force to good social changes (Yang, 1993). As for a society or a country is concerned, the development as well as the role and goal of technical vocational education (henceforth, TVE) are influenced by trend of the times and environment. Obviously, the role of TVE is becoming more and more important under the impact of socially and economically structural changes on its development.

In view of the needs of this rapidly-changing society, our government launched the "Developing and Improving Junior High School Technical Vocational Education Program--Toward Achieving Ten-Year Compulsory Education Objectives", a project which aimed to provide pre-employment education to junior high school graduates who did not continue their education and were unemployed or those who had the aptitude or preferred to start a career upon graduation. This project was approved by the Executive Yuan on November 23, 1993. The implement of this project was divided into two stages. The first stage experimental was from July, 1993 to June, 1995. If the expected goals were achieved in this stage, the project would be fully implemented out starting from the academic year of 1995 (Ministry of Education, 1993).

TYCEP in its first stage in 1993 involved 867 classes at 202 junior high schools. The cooperative practical skill education programs were consisted of 35 careers and have home-school-based education with 54 career programs offered. Each career program had successive classes for further education. In 1994, there were 20,000 participants (Ministry of Education, 1994) within 633 classes of cooperative practical skill education, 363 classes of private practical skill education, and 53 classes of special practical skill education. Besides, the technical arts education center attached to high schools opened 60 classes. In total , there were 1,109 classes and 39,000 students involved (Chang, 1994). It was estimated that from 1994 to 1997, there would be NT$2,450,000,000 spent on the junior-high practical skill education classes, and NT$2,790,000,000 on the extended education classes (excluding the cost of compiling lesson plans and teaching materials, the cost of qualification examinations, investigations, and all the other activities). The total expense to this project would be over NT$5,200,000,000 (Ministry of Education, 1993).

In the face of the rapidly-changing society, the government certainly deserved our praise for implementing the TYCEP and trying to help adolescence become more independent and better prepared for future career. However, the implementation of such an educational project deserves considerate review. Therefore, whether or not the project meets the needs of the society, the economy, the educational reformation, and students' career development needs further investigation. The investigation is needed since TYCEP has been implemented for more than a year, and its appropriateness will affect its development in the future. The present study intends to discuss the changes in human resources, the economic growth, the social conditions and problems of adolescent crimes in our country, making reference to the career-development theory and techniques in guidance, and to the conditions in Germany, UK, France and the USA. Besides, related suggestions received from the academic circle, the business circle, and those who carried out this project in schools are included in the present study. Therefore, the research of this study can serve as an important source of references for the administrations. At the same time, the result of the study can also bear testimony to the new situation on TVE in our country.

Methods and Procedures

The present study investigates the feasibility of the TYCEP by adopting a qualitative analysis from educational, economical, social, career development, adolescent employment, crime, and value judgment perspectives, and by utilizing a quantitative analysis of the junior high school third-year (JHS-3) students' Career Development Inventory and the opinion polls of the project interviewers and those of junior high school administrators and teaching faculty.

Data upon which this study was based were collected through stratified random sampling method. They consist of 1,410 JHS-3 students on technical track, 1,250 students on general track, and 510 TYCEP participants involved in this research project including junior high, senior high and vocational school principals, administrative staff, and full-time teachers. In addition, the opinions of 50 members (as project interviewers) of the TYCEP Evaluation Committee, Ministry of Education were also collected for this study. Due to the limitation of the researcher's time and ability, the subjects chosen are mainly from the five central countries in Taiwan, including Mao-li County, Tai-chung County, Taichung City, Chang-hua County, Nan-tou County. Therefore, the discussion and range of the research results are applicable only to the given population.

The students used two questionnaires: (1) the questionnaire for the career development attitude, (2) the questionnaires for the career development aptitude. The scholars, principals, administrators, and teachers use the two questionnaires and one visiting list for industrial field designed by the researcher. The pretest was conducted by the researcher to the practical skill class and the fifth class at the 3rd grade in Taichung Municipal Chu-ren Junior High School on November 16 and 17, 1994. Most students finished answering within 45 to 50 minutes. The instructions were also modified after the discussions with Mr. Ying-chuan Chu, the former Counselling Director. As to the administrators, the principal, the director of Teaching affairs, and the chief of the Section of Discipline of the school answered the questionnaires. They also offered the opinions for the modification of the questionnaires. As to the questionnaires for the interviewers, several interviewers and scholars were consulted to offer their comments for the modification.

According to the sampling design, the scales and questionnaires were sent out on November 16 and 17, 1994. To increase the returning rate, the Technical Department in the Ministry of Education assisted on sending the scales and questionnaires. We contacted any individual or school that had not sent the questionnaire back after three weeks. The whole process was completed after a month. At the end, 41 questionnaires from the interviewers, 379 from the administrators and teachers, 1075 scales and questionnaires from the practical skill class students, and 1092 from the general class students were received. The return rates are 82 %, 75.2 %, 76.2 % and 87.4 % respectively.

Findings and Conclusions

According to data analysis and the related literature review, this research was concluded that the TYCEP was found to be positive and affirmative in terms of the eight generalizations reached in this study.

1. The feasibility of ten-year compulsory education program are nearly perfect, and correspond to nowadays social needs. With the world-wide trend of educational reform, and due to the whole environment of our social development, this project is feasible.

2. The goal of TYCEP is to offer a complete and systematic practical course so as to make sure that all citizens can receive ten-year compulsory education. We will help those who are suitable for practical skill education to receive at least two-year technical education from the third year of junior high school in order to make them become employable in career. To achieve the five goals of the project, we must get rid of the idea of thinking nothing but entering a higher level school, help those who are not interested in studying receive technical vocational education heartily, and cope with the different ideas of cross-school cooperation.

3. The practical skill classes should focus on developing skills and practice. For instance, the BGJ of Germany and the Certificate of Pre-vocation of Education of the UK help students receiving vocational education choose their own favourite departments corresponding to their interest. These are good examples for us to learn. The tenth year compulsory education nevertheless aims at preparing for vocation. So the skill examination is arranged at the second semester of the tenth year to make students get c-grade national certificate as our final goal.

4. The method to execute the ten year compulsory education is a crucial factor to decide whether the plan can be implemented or not. Generally speaking, people pay too much attention to diploma, because people are paid according to their diploma. Though the students graduated from the ten-year compulsory education programs have practical skills. If we offer more alternative school entrance pathway for these students, it will encourage excellent graduates of junior high school to receive technical vocation classes. This will guarantee the success of the ten-year compulsory education.

5. The technical vocation education focuses on the needs of both the general students and the special needs students, such as the handicapped teens, minor tribes, and those who learn quickly and the disadvantaged. The ten-year compulsory education does take care of the handicapped and the disadvantaged students, but ignores the exceedingly smart and the minor tribe students. Besides, in order to help the crime-inclined teenagers directly, we should offer practical skill education classes to make them become employable in certain careers, and then they can earn their own life after they are set free and go back to society.

6. Career guidance is a long-term process. Teenagers are probing into the career development. They differ with each other in physiology, psychology, individual environment, background, interest, disposition, attitude and values. Selecting careers has much to do with career guidance. The goal of career guidance is to understand further individual personality, to assist every teenager to confirm his own particularity in order to develop self-potential, and to choose the direction and aim of career development. Thus they are well-prepared for everything to expand individual's future step by step.

7. After more than one year the practical skill education was put into practice for, we encounter a series of problems: the selection of students, the career guidance of students, budgets, textbooks, facilities, administration connection, traffic, teachers' quality, and teaching methods. Those problems mentioned above should be noticed in the future implementation of the project.

8. The practical skill classes in the ten-year compulsory education cooperate with the business field, and this will not only make students understand the future of their jobs and the needs of society but put the technical teaching into practice.

Implications and Recommendations

Based upon these findings and conclusions, this study proposed six concrete recommendations for improving the TYCEP.

1. Establish a complete linking system of TYCEP.
2. Properly design the curriculum, teaching process and evaluation.
3. Correctly select students for guidance.
4. Set up a special case to improve soft/hard-ware facilities.
5. Provide sufficient executive support in the nick of time.
6. Fully make use of the community source.

Curriculum Renewal of Chemical Engineer by Job Analysis in Korea

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Abstract

This study aims to acquire the raw information for the curriculum renewal of the chemical engineering course. To achieve the purpose of the study DACUM workshop, which is proven to be a very efficient job analysis method, was implemented with 10 experts from various industries.

As a result of this study some significant findings were obtained and are as follows: 1) Current subjects in the chemical engineer course are relatively theory oriented ones. 2) The industries require the competencies relating to the developing new chemical products including marketing, after service, feasibility study, literature review, inquiring patent information, and bench scale testing. 3) Some basic experiences concerning the designing and construction of a chemical plant are needed. 4) Many tasks relating to the management and supervision of a chemical plant also are needed.

On the basis of the above findings, some recommendations for the curriculum renewal were suggested to the chemical engineer course. Fir-

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stly, the subjects concerning a chemical plant construction and management have to be added to the current curriculum. If the college can't equip the necessary facilities, the students might gain experiences with the cooperation of industries. Secondly, the non-technical competencies must be emphasized in class.

1. Purpose and Validity of Research

There are always some gaps between industries' needs and the educational situation. Because of fast changes in technology these gaps are getting broader and deeper. In particular the chemical industry has grown drastically during the last three decades in Korea. Recently a third chemical industry complex has been built on the western coast, Korea became the third biggest chemical industrial country in terms of the facility capacity. But in spite of external growth the weight within the whole industries has been decreased slightly. Within the country because of general economic stagnation the market has been changed from being supply centered to demand centered and the competition has become more serious among rivals. However, China has specially contributed to save Korea from the trouble by importing Korean chemical materials. However, the exporting environment is getting worse, because many southeastern countries have expanded their capacity and importing countries reduced the amount of importing through strict regulations. Furthermore this the domestic capabilities to develop new goods and new processing technology is too limited and slow to be efficient through the M & A between industries and are launched into the new specialized field.

Therefore, in order to overcome the above mentioned situations, it is most important to educate of competent chemical engineers. To educate competent engineers the proper curriculum is essential. That is why this study aims to find the industries' needs through job analysis with the help of experts attending from industry.

2. Theoretical Background

In the analysis, there are many methods that need to be implemented according to the properties of occupation. When we analyze the newly born occupation which has a limited numbers of jobs, the new analysis method such as interviewing, observation, questionnaires and video taping could be effective. But as far as the broad range of occupations such as skilled worker, technicians, and engineers concerned the verification method and DACUM are more effective.

Through the researcher's experiences during last 15 years, the job analysis relating to the professionals like a engineer occupation is very difficult to do, but there is no better way than DACUM. DACUM, Developing A Curriculum, is a relatively new and innovative approach to occupational analysis for curriculum development. It has proven to be a very effective method of quickly determining the competencies of the workers or tasks that must be performed by them in a given job or occupational area, The DACUM chart produced from the DACUM analysis, a detailed graphic portrayal of the skills or competencies involved in the occupation being studied. The DACUM analysis can be used as a basic information for curriculum development, student learning, training needs assessments, worker performance evaluations, and competency test development.

A group of eight to twelve experts was carefully chosen from the occupational area under consideration of the DACUM committee. Committee member are recruited directly from various industries. The committee works under the guidance of a facilitator for two to three days to develop the DACUM chart.

Since the first essential step in any CBE program involves the identification of the tasks or competencies upon which the instructional program will be based, DACUM is particularly well suited for educational institutions and agencies that are implementing or are planning to implement competency-based education (CBE). The DACUM process is ideally suited for researching the competencies that should be addressed in the development of new training programs, the competencies that should be delivered by existing training programs, and the current relevance of existing DACUM charts.

3. Methods and Procedures

3.1 DACUM Workshop Procedure

This workshop procedure was taken by the DACUM committee members as follows;

1996.6- 1996.8	DACUM workshop preparation
1996.9- 1996.10	DACUM committee member
1996.11.3-4	DACUM workshop for chemical engineer
1996.11-1996.12	DACUM chart verification
1997. 1	DACUM chart revision and printing

3.2 Workshop Process

The whole DACUM process is divided into three phases: preparation, workshop, and verification. This workshop was implemented under the support of a government fund for providing competent engineers from the university to industries.

First of all the DACUM coordinator set up the workshop schedule and reserved the DACUM room at the Adira Hotel located in Yusong hot spring resort area. Then the coordinator selected ten committee members through consulting with the faculty member of the Chemical Department of the College of Engineering, the Chungnam National University, and sent invitation letters to the committee members and the observers. The DACUM workshops were implemented with 6 sessions. Each session took one and half an hour. At the first session the facilitator oriented the attending committee members. Then at the following sessions the facilitator identified the competency area and the tasks. Before closing the whole sessions they elaborated the frequency, difficulty and significance of each task.

After producing the DACUM chart (seeing the appendix) the researcher verified the DACUM chart through checking by other experts.

4. Findings and Conclusions

Using the DACUM process the researcher found some distinguished facts which are as follows; 1) current subjects within chemical engineer course are relatively theory oriented ones 2) the industries require the competencies relating to the developing a new chemical products including marketing, after service, feasibility study, literature review, inquiring patent information, and bench scale testing 3) some basic experiences concerning the designing and construction of chemical plant are needed 4) many tasks relating to the management and supervision of a chemical plant also are needed.

5. Recommendations and Suggestions

On the basis of the above findings two recommendations for the curriculum renewal are suggested to the chemical engineer course.

Firstly, the subjects concerning with chemical plant construction and management have to added to the current curriculum. When the college couldn't equip the necessary facilities, the students might get experiences through the cooperation with industries.

Secondly, the non technical competencies such as marketing, searching informations, client managements, assessment of products and so on must be emphasized in class.

DACUM Chart of Chemical Engineer

Job Description: Engineers who research and develop the chemical products by applying the chemical theories or design, construct and manage a chemical plant

Task field ← Required job ability →

A	Chemical product design	A-1 marketing of the chemical products C A	A-2 analysis of project validity A A	A-3 analysis of introducing technological know how A A	A-4 analysis of the existing chemical products C B	A-5 foreign and domestic literature review B C	A-6 analysis of the raw materials C C	A-7 analysis of information on patent C C	A-8 analysis of the validity of chemical product development A A	A-9 computer modeling C B	A-10 bench scale test A B
		A-11 study on the product evaluation method C C	A-12 analysis of physical properties of samples C B	A-13 analysis of manufactured samples A B	A-14 marketing of manufactured samples B B	A-15 determination of product specification B B	A-16 study on the chemical processes A A	A-17 application technology development B B	A-18 safety analysis of chemical products B A	A-19 analysis of new technology in the chemical industry A A	
B	Chemical process design	B-1 literature review on physical properties B B	B-2 determination of production capacity A B	B-3 analysis of the environmental effect B B	B-4 determination of complete process system A A	B-5 determination of unit process system A A	B-6 preparation for flowing chart for complete process A B	B-7 design of unit equipment A A	B-8 determination of equipment and facility materials B B	B-9 recording of material and energy balance A A	B-10 determination of the process control system A A
		B-11 determination of environmental and safety system A A	B-12 drawing of a P & I diagram A A	B-13 lay out of the plants A B	B-14 preparation for an operating manual A B						
C	Chemical plant construction	C-1 preparation for the construction program A A	C-2 readjustment of design in detail A A	C-3 evaluation and selection of an equipment manufacturing company B B	C-4 preparation for ordering specification of the equipment B C	C-5 management of construction process A B	C-6 analysis of the chemical plant facilities B B	C-7 planning of test running B B	C-8 preparing of test running of unit process B B	C-9 simulation for optimal process A B	C-10 test running of the chemical plant A A
		C-11 evaluation of the test samples of chemical products B B	C-12 securing performance of the chemical plant A A								
D	Production of chemical goods	D-1 preparing for education plan for technicians B C	D-2 technician training in the chemical plant B B	D-3 production planning in a unit factory A C	D-4 operation of production facilities A C	D-5 analysis of condition of production process A A	D-6 troubleshooting A A	D-7 analysis of productivity B B	D-8 maintenance of production facilities B B	D-9 improvement of production process for the chemical products A A	D-10 substitution and improvement of raw materials B B

Note 1) The task of the cells bordered with bold line represents the abilities that should be equipped in the beginning stage.

Note 2) The combination the alphabets on the right bottom side of a cell displays the rating of importance and difficulty. A is the highest, B is medium, and C is the lowest.

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E	Management and operation of the chemical plant	E-1 determination of the type of raw materials B B	E-2 examination of raw materials C C	E-3 determination of the type of half finished goods B B	E-4 intermediate examination of half finished goods C C	E-5 examination of the end products B C	E-6 analysis the cause of inferior goods and treatment A A	E-7 improvement of quality chemical products B A	E-8 analysis of economical basis for chemical plant A B	E-9 adjustment of production program for the whole plant B B	E-10 management of the producing cost A B
		E-11 standardization of production techniques for chemical product B B	E-12 determination of the treatment of by-products B C	E-13 determination of the treatment of wastes C C	E-14 analysis of pollutant in the chemical plant C C	E-15 controlling of anti-pollution facilities B C	E-16 safety controlling in the chemical plant B B	E-17 management of the raw materials C C	E-18 control of shipment of chemical products C C	E-19 improvement of packing methods of chemical products C C	E-20 automation of chemical plant facilities B A
		E-21 application of the new technology A A	E-22 improvement of examination methods of raw materials and products B B								
F	Engineering service	F-1 preparation for introduction to chemical products B B	F-2 preparation for user's manual B C	F-3 analysis of consumers contentment B B	F-4 solution of the dissatisfaction of consumers B B	F-5 support of the chemical product analysis B B	F-6 usage development of chemical products B B	F-7 technical education for chemical product consumer B B	F-8 support for a cooperating companies C C	F-9 consulting of technical know-how of the chemical engineering C A	F-10 support for the cooperation between industries and schools C C
		F-11 preparation for data base of consumers B C									
G	Unit process	G-1 comprehension of combustion technology A A	G-2 comprehension of oxidation technology A B	G-3 comprehension of reduction technology A B	G-4 comprehension of neutralization technology A B	G-5 comprehension of nitration technology A B	G-6 comprehension of esterification technology A B	G-7 comprehension of saponification technology A B	G-8 comprehension of amination technology A B	G-9 comprehension of halogenation technology C A	G-10 comprehension of sulfonation technology A B
		G-11 comprehension of sulfurization technology A B	G-12 comprehension of hydration technology A B	G-13 comprehension of hydrogenation technology A B	G-14 comprehension of alkylation technology A B	G-15 comprehension of thermal degradation technology A A	G-16 comprehension of polymerization technology A A	G-17 comprehension of fermentation technology A A	G-18 comprehension of calcination technology A B	G-19 comprehension of bleaching technology A B	G-20 comprehension of electrochemical process A A
H	Unit operation	H-1 comprehension of fluidization technology A B	H-2 comprehension of heat transfer technology A A	H-3 comprehension of evaporation technology A B	H-4 comprehension of absorption technology A B	H-5 comprehension of humidification & dehydration technology A B	H-6 comprehension of extraction technology A A	H-7 comprehension of adsorption technology A A	H-8 comprehension of distillation technology A A	H-9 comprehension of filtration technology A B	H-10 comprehension of sedimentation technology A B
		H-11 comprehension of mixing technology A B	H-12 comprehension of drying technology A B	H-13 comprehension of sieving technology A B	H-14 comprehension of centrifugation technology A B	H-15 comprehension of size reduction technology A A	H-16 comprehension of rolling technology A B	H-17 comprehension of extrusion technology A B	H-18 comprehension of injection technology A B	H-19 comprehension of dust collection technology A A	H-20 comprehension of membrane separation technology A B
		H-21 computer simulation of the unit operation A A	H-22 comprehension of crystallization technology A B	H-23 comprehension of the ion exchange technology B B							

Note 1) The task of the cells bordered with bold line represents the abilities that should be equipped in the beginning stage

Note 2) The combination the alphabets on the right bottom side of a cell displays the rating of importance and difficulty. A is the highest, B is medium, and C is the lowest

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Jobs in the 21st Century, Are Labor Market Needs Changing?

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Abstract

The writer has studied workforce and labor market changes in the State of Wisconsin and the U.S. for more than 30 years. Analysis of projections of numbers of jobs by job title and income trends to the year 2005 in Wisconsin and the U.S. indicate that the great numbers of high-tech, high skill and high pay "jobs of the future" are a hoax.

Vocational Education in Wisconsin and the U.S. has had success. Schools have continued to change their curriculums and instructional methodologies and have now incorporated the new computer based technology. Education in the 1990's is still blamed for our economic and social problems and education reform is said to be the panacea for our social and economic problems. In the 1990's, Youth Apprenticeship is an insignificant and extremely costly spoof, Tech-Prep is wasteful hyperbole, School-to-Work is a new name for activities that schools have been doing forever, except in the 1990's millions are being wasted on useless hype and standards.

Introduction

The media and educational publications in the U.S. and internationally talk constantly about changing labor market needs. Is this just rhetoric or are the vast majority of jobs of the 21st Century the same as those of the 1990's?

Whatever happened to the forecasters of the future for the year 2000 who kept repeating with great passion and concern in the 70's and 80's that a majority of people would be working at new and emerging occupations by the year 2000? The reality is that new tools like computers are used in the same old occupations that we have always had. These new tools make jobs easier, not more difficult, in most cases. If you asked the "experts" what new and emerging occupations people should be trained for, the answer would probably be that they could not be specific because the new jobs had not emerged yet.

The purpose of this paper is present hard data that shows the reality of what the jobs of the future really are and the educational and skill requirement levels for these jobs.

Procedures and Methods

The writer has been analyzing the official work force statistics of the State of Wisconsin and the U.S. Bureau of Labor Statistics for more than 30 years. In addition the writer has been studying education statistics at the national, state and local levels in the U.S. The findings and conclusions found in this paper are all based on analysis of statistics obtained from government or independent research organizations.

The Center for the Study of Jobs & Education in Wisconsin, has produced at least one report each month since being founded in July 1995. This paper is a compilation of data, findings and conclusions from numerous reports of the Center.

Findings and Conclusions

The following are some examples of statements quoted often in the State of Wisconsin and the U.S.:

- 70% of new jobs will require more than a high school education, but less than a 4-year degree. (70% is down from 80% a few years ago).
- By the year 2000, 44% of all jobs will include collecting, analyzing, synthesizing, storing and retrieving data.

A graph for Wisconsin in the complete paper, "Occupations with the Greatest Expected Employment in 2005", shows that none of the top 30 occupations is a new occupation. As a matter of fact, the top occupations in the year 2005 are about the same ones that were the largest in 1970 or 1980, with few exceptions.

Some interesting facts shown on this graph are as follows:

1. Retail clerks comprise the largest single projected occupational title in Wisconsin in the year 2005 (80,053 workers or about 3% of jobs). This occupation is No.1 in the world, including Germany where retail clerk is the No.1 apprentice program for high school age youth and has been the No.1 occupation for many years (perhaps for most of the 20th century) in the entire U.S.

2. There are few changes in rank in the top 30 from 1990 to 2005. Registered Nurses, Nursing Aides, Secondary Teachers, Child Care Workers and Gardeners are examples of occupations that moved up slightly in rank. Trunk Drivers-Heavy, Bookkeeping-Accounting and Bartenders are examples of top 30 occupations that dropped slightly in rank.

Eight "Employability skills of the future are often stated as follows:

* Problem-solving and reasoning
* Computer operation
* High-level? reading, math, communications
* Occupational proficiency
* Critical thinking? (What is this? Can it be taught?)
* Ability to work as part of a team
* Ability to make decisions
* Ability to accept change

What's new? What changes in jobs will occur from 1990 to 2005 that will make the above skills more important in the year 2005 than they were in 1990? User- friendly new technology makes jobs easier not more difficult. Elementary school children can learn computer operation and so can mature adults in a short period of time. The graph shown in the complete paper, "Employment in the State of Wisconsin 1990 & 2005 in Selected Occupational Areas" shows that there is little change in the proportion of workers by occupational titles expected from 1990 to 2005. Some interesting facts shown on this graph are as follows:

1. Forty Eight secretarial and general office job titles are projected to have 247,340 workers or 8.7% of the 2005 workforce.

2. Fifteen different occupational titles (not including managers) in the area of food and beverage service and fast food are projected to have 233,520 workers or 8.2% of the total workforce. Bartenders, waiters and Waitresses will make up about 2.7% of the total workforce the same percentage as 32 job titles in the construction trades.

3. Fifty two occupational titles in the categories of engineer, scientist, engineering technicians, computer and mathematical occupations are projected to employ 97,554 workers or about 3.4% of the workforce in the year 2005.

4. Health Care Practitioners and Technicians (36 job titles) show a large projected percentage increase (33%) 102,620 to 136,260 workers (4.8%) of 2005 workforce. However the number of nursing and home health aides (not included in the 36 previous health job titles) are projected to increase by 17,080 (43%) from 39,530 in 1990 to 56,610 in 2005 and the percentage of the workforce should increase from 1.6% to 2.0%.

The number of nursing aides (56,610) should exceed the number of registered nurses (48,110) in the year 2005. The number of nursing aides greatly exceeds the number of elementary (33,449) or secondary teachers (38,939) expected in the year 2005.

Does anyone ever study and analyze occupational data? It appears that everyone just accepts the nonsense rhetoric that appears in the media that is based on anecdotal comments and studies that do not have credible hard data.

The rhetoric about the relationship between schools and jobs is preposterous and irrational. It is said that "That 70% of the jobs in the future will require education beyond high school and below the baccalaureate level". This is the very basis of the stated need for school reforms like Youth Apprenticeship, Tech-Prep and School-to-Work in the U.S.

In the State of Wisconsin about 73% of 1996 high school graduates indicated they would enroll in a 4 Year College (50% or 25,515 students) or a vocational/technical school (23% 11,876 students). Only 15% indicated they would go directly to work (9% or 4,712 employed) or seek a job or to participate in a job training program (6% 3,221 students). (2) A majority of jobs in Wisconsin and the U.S. require only short term or moderate-length training or "on the job" experience with no school related training. (1)

In 1995-96 29,756 students (24.5% of total statewide 121,144 11th & 12th grade enrollment) participated in work based learning activities such as co-op programs. (3) (760 or .6% of 11th & 12th graders participated in Youth Apprenticeship) More than 10,000 Wisconsin high school graduates (of about 50,000 high school graduates each year) have completed vocational work related programs for many years. In 1996 160 graduates completed Youth Apprenticeships.

Implications and Recommendations

The majority of the "jobs of the future" are not in high tech and so called technical occupations or "high skill" manufacturing jobs. Manufacturing jobs can now be done by illiterate children in third world countries. Computers and high tech devices are made by workers without any advanced math education anywhere in the world.

My elementary school grandchildren can operate computer software and use the Internet with better techniques than I can because I never had any formal education of any kind in the use of computers. (However since retirement I have become an expert on computers.) My pre-school grandchildren can use interactive television CD's by themselves after a few minutes of instruction. What is the big deal about computer education and the need to waste millions of dollars wiring up to the Internet and using high priced university people to train teachers to do what many elementary school kids can already do.

Technology and computer related equipment make jobs easier not more difficult. Should we require retail clerks to take physics because they operate high tech cash registers. Should we require foundry workers to take trigonometry because they have to push a button on a machine that makes complex mathematical adjustments in the manufacturing of a casting.

The "jobs of the future" are mostly located in places like nursing homes and other health related facilities, restaurants, tourist attractions and facilities and shopping malls. Temporary workers and service occupations in lower paying job titles are numerically the fastest growing job sectors if not by percentage. The U.S. has a glut of highly educated workers in all fields including mathematics.

As indicated by Bureau of Labor statistics the "jobs of the future" require mostly short term training and/or experience not long term training or experience. This training is done in most cases "on the job" not in schools. Education is needed to have a well functioning civilized and democratic society. Why do political and educational leaders demean education by associating it only with jobs? Why, because education is a very convenient scapegoat for our social and economic problems that are being ignored by our political leaders at the national, state and local level. Politicians, chosen educators and business personnel are feeding well at the public trough, so why should they "blow the whistle" on the nonsense about jobs and education that are seen in the media every day. Some may actually be naive enough to believe that the "business interests" and the university elite know what they are talking about.

I have been calling the high tech jobs of the future myths in writing since 1983, always using official State of Wisconsin or U.S, Bureau of Labor statistical projections as evidence.

Educational reform and the take over by the Governor of Wisconsin of education from an existing independent Wisconsin Department of Instruction are needed to "Create a high wage, high skilled Wisconsin workforce, thus insuring prosperity and economic opportunity for future generations of Wisconsin citizens". Where is the research evidence and documentation for making such statements? There are none. The high skill, high pay jobs of the future? are a hoax! (1)

Vocational Education in Wisconsin and the U.S., developed in the 20th Century, has had exemplary success. Schools have continued to change their curriculums and instructional methodologies through the 20th Century and have now incorporated the new computer based technology. Improvements must continue to be made as technology improves. But that has not been enough, education in the 1990's is still blamed for our economic and social problems and education reform is said to be the panacea for our problems. Why do we want to fix (destroy) schools that are not broke? Insane is too mild a term.

Periodically the new reforms appear, In the 1990's, Youth Apprenticeship is an insignificant and extremely costly spoof, Tech-Prep is wasteful hyperbole, School-to-Work is a new name for activities that schools have been doing forever, except in the 1990's millions are being wasted on useless hype and so called high standards. As long as the chosen ones in education and the business community are feeding well at the trough and the politicians are making them happy the deceit and hype goes on. What is going to happen in two years when the federal faucet is turned off?

Wisconsin schools, including the Milwaukee Public Schools (under very difficult conditions) are doing a good job, perhaps in spite of Madison politicians and bureaucrats. The evidence is overwhelming.

The bashing of educators and public educational systems never ends. It has been going on forever. Aristotle was bashing schools more than 2000 years ago and the major bashers of education today are the same as those of yesteryear. Examples: the learned elite (university professors), religious zealots, "the business interests", the media, politicians and political bureaucrats, educators (many in self defense), the oppressed and minorities and those who "have it made" who are disciples of "survival of the fittest".

All of the above have their own self serving interest in bashing schools. In the case of some university elite and political bureaucrats, they exist, thrive and feed themselves off of school bashing with little accountability for themselves. When school reforms do not work as planned they blame uncooperative school systems and teachers and move on to the next new reforms. These reforms or "restructuring" in the modern idiom are not new in most cases, just old ideas with new terminology and educational jargon.

Reality is: 1. For the majority of the jobs in the world and the U.S., other than reading, writing, arithmetic, and developing a work ethic, there is not a direct relationship between education and jobs. 2. Education for education sake is good and is helpful in getting a job and doing it well. However there is a surplus of well educated people for jobs that require higher levels of education and training. 3. The economic problems of the world are on the demand side not the supply side. Supply side education and training does not create good paying jobs anymore than failed supply side economics. 4. The problem for the "world" is to create family living wage jobs.

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Job Performance Aids: Guidance for Improved Performance

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Abstract

A job aid, also called a performance aid or job performance aid (JPA), **provides procedural or factual guidance in the performance of a task.** JPAs are used on the job to guide performance while skill is being developed, and as a reference guide, by experienced workers. They are a cost-effective alternative or supplement to formal training. Using a JPA to help perform a task also provides a natural and effective way of committing the necessary information to long-term memory.

Introduction

A job aid, also called a performance aid or job performance aid (JPA), **provides procedural or factual guidance in the performance of a task.** JPAs are used on the job to guide performance while skill is being developed, and as a reference guide, by experienced workers. They are a cost-effective alternative or supplement to formal training.

The problem-solving booklet which accompanies a photocopier is one example of a JPA. It guides the user in troubleshooting or clearing a "jammed" machine. While machine users might receive an orientation on how to utilize the JPA, the need to remember what to do in case of trouble is eliminated, since the booklet would be located with the photocopier where it can be put to use when the need arises. In this example, the JPA guides performance by providing easy-to-read, illustrated information on **what to do** and **how to do it correctly.**

Because of the time, effort, and expense of training-for-recall and the failure-to-retain problem, the cheaper and more effective JPA should be considered as a **viable alternative** to formal training. Regardless of how great the learning gains, there is often a dramatic loss in retention after training.

Recall of knowledge and skills is a function of two factors: the time interval between initial learning and the opportunity to perform the knowledge or skill, and the frequency of performance. Studies support the principle, drawn from experience, that we lose what we don't use, and the loss soon after learning is profound. Using a JPA to help perform a task also provides a natural and effective way of committing the necessary information to long-term memory. JPA users eventually learn to do without them, but find it reassuring to have a ready reference if and when the need for help arises.

Appropriateness of Use

Almost any task that needs sustainable, proficient performance, and is too complex or important to leave to pure memory, is a candidate for JPA guidance. Tasks with recurring problems attributable to human error and those involving regulatory compliance and liability are prime candidates.

JPAs are particularly appropriate when a delay can be tolerated (a) between the point at which the need for task performance becomes evident and the time performance must begin, and (b) in the speed of task performance. Such a delay may result from the time required to get and use a JPA.

Inappropriateness

Some circumstances or conditions associated with task performance preclude the use of a JPA. For example, its use is impractical when (a) there are adverse environmental conditions, such as darkness; (b) there is a credibility barrier, e.g., surgeons are expected to "know" what they are doing; or (c) the task is so new or ill-defined that uniform procedures have not been established. In addition, JPAs are inappropriate when speed in performance is required — in an emergency situation there may not be time to consult a JPA.

Even if circumstances or conditions rule against the use of JPAs in the workplace, considerable training time, effort, and expense can be saved when they are prepared for use as instructional aids in a course or program.

Nevertheless, **the best cost-benefit relationship exists when a JPA is used as an alternative to training** (Campbell, 1996).

Impact on Training

For tasks that require a great deal of practice, are performed often, and for procedures that must be memorized, **JPAs are a low-cost form of instructional material.** They reduce the time needed to master task performance and facilitate the transfer of learning from the schoolhouse to the workplace. In addition, JPAs are generally easier, quicker, and less expensive to prepare than other instructional materials (Bullock, 1982, p. 37).

As long ago as 1977, Lineberry suggested the ". . . use of job [performance] aids in preference to instruction whenever possible because they are more reliable in delivering desired performance, cheaper, easier to revise, and shorten training time" (p. 89). He further pointed out that these are important concerns because of the demand for cost-effective training and the need to alter task performance information as technology and jobs change.

The use of JPAs provides a viable alternative to initial formal training, and facilitates refresher or booster training on the job. Scanland and Scanland (1981) reported that JPAs are capable of "significantly reducing (up to 75%) the training required for inexperienced workers to accurately perform routine maintenance tasks" (p. 28). They are a good choice when (a) there is little time or budget for training, (b) just-in-time self-instruction is necessary, and (c) skill upgrading becomes important (Chalupsky & Kopf, 1967, pp. 55 & 62). Moreover, they facilitate learning at the point where true proficiency is developed — on the job.

Advantages

The use of JPAs reduces training time while enhancing worker versatility and proficiency. This translates into less rework and downtime; fewer errors, complaints, and mishaps; and improved quality as well as accuracy. Research findings also pointed out that the use of JPAs can save time in the workplace, especially in the performance of lengthy tasks. Therefore, it appears justified to infer that JPAs affect productivity in positive ways. Among the advantages reported by Chalupsky and Kopf (1967) are (a) increased ability of inexperienced workers to perform complex tasks proficiently; (b) elimination or reduction of the need for close instructor scrutiny, coaching, and guidance for complicated tasks; and (c) more uniform product quality and conformance to requirements (p. 26).

As jobs expand in scope and tasks increase in number, length, and difficulty relative to workforce characteristics, the use of JPAs merits serious consideration. Many tasks can be performed completely and proficiently with JPA guidance if those performing the task are competent in the necessary basic skills, including the use of tools, equipment, and materials.

Also, unlike information that once learned is quickly forgotten if not used, JPAs are not subject to decay. While procedures are forgotten more quickly than skills, JPAs effectively aid memory by storing information in a readily accessible form. This could be laminated decision tables in a maintenance worker's tool box or illustrated procedural guides hung conveniently on the wall above a workbench.

Presentation Forms

JPAs appear in a variety of printed forms and materials. Each may be more or less suitable than another, depending on the task and workplace conditions. **Booklets/pamphlets, pocket/wallet-size cards, placards, decals, and templates/overlays** represent some of the options available. However, a series of illustrations or directions on an audio or video tape as well as information on a computer screen are also JPAs when they (a) reduce the amount of information to be remembered, (b) specify what actions to take, (c) indicate when to take each action, and (d) are used in the actual performance of a task.

Several studies (Booher, 1975; Dwyer, 1968) show that a JPA in printed form is more accurate than a series of illustrations, but illustrations generally take less time to use. Research also found that there is better comprehension and retention when information is presented in print rather than on a computer screen (Staff, 1988). Moreover, it generally takes longer and costs more to present JPAs on a computer screen than on paper. The implications for those who prepare JPAs are obvious: in spite of technological advances, the printed (hard copy) form of presentation remains a good choice, especially when the potential for electrical power and equipment failure is considered.

Types

The various presentation forms for JPAs can be classified by type. There are five basic types: (a) procedural guide, (b) worksheet, (c) checklist, (d) decision table, and (e) flowchart. The criteria for deciding on which types of JPA to prepare are the (a) nature of the task (e.g., step-by-step procedures), (b) user requirements (e.g., what they need to know), (c) user characteristics (e.g., reading level), (d) physical environment, and (e) how the JPA will be used in the job situation (e.g., as an aid for experienced workers, or as a training aid). In some cases, only one type will satisfy all or most criteria. In others, the task itself or user preference leads to the choice of a particular type.

Experience has shown that, in general, procedural guides are better for routine assembly, maintenance, and equipment operation where there is a regular sequence of steps to be performed and time is not critical. In emergency decision-making situations, an easy-to-follow flowchart is the best type.

The following headings supply important details about each of the five types.

Procedural Guides

This type of JPA presents task-steps (procedural statements) which are performed in their numbered order (numerical sequence). Procedural guides are developed in accordance with the following guidelines:

1. Place the behavioral action (task) statement at the top of the first page. Utilize full capitalization and/or bold typeface for emphasis.
2. List all the tools, implements, instruments, utensils, equipment, materials, supplies, and ingredients required to perform the task.
3. Provide clear, explicit, and complete directions on how to use the JPA. Optional; omit when unnecessary.
4. Write precise procedural statements: **Begin with an action verb** and include information on **what to do** and **how to do it** correctly. The activity in any one step needs to be small, so the user can recall it long enough to perform correctly.
5. Sequence and number the procedural statements in the order they are to be performed. The numerical sequence indicates **when to perform** each step.
6. Include meaningful, high quality illustrations and precautionary information (notes, cautions, or warnings) when appropriate.

Worksheets

Preprinted sheets with short, simple directions and blank spaces where information is to be inserted are called worksheets or forms. Typical examples are (a) job and college admission applications; (b) income tax and purchase order forms; and (c) inspection, accident, and travel expense reports. Situations that require worksheets include (a) summarizing information from other sources, (b) collecting and reporting data (information, facts, or figures), and (c) making calculations.

When the instructions for completing worksheet items are complex or lengthy, a procedural guide is prepared to accompany it. Another approach is to reduce the size of the form and put instructions concerning items in the margins. Use of a different typographical format and/or bold typeface for the instructions helps to make them stand out from the form itself. Leader lines can be used to direct the user's eye from instructions to the blank item spaces or boxes (Campbell, 1996).

Checklists

Checklists present questions, actions, and so forth to be considered or performed and then marked (checked) as a matter of record. They are an efficient and functional type of JPA for before, during, or after job task performance to improve consistency and identify oversights. When performance and safety requirements are high, checklists may be used even if the procedure is well-known or memorized. In any case, one of their advantages is to minimize the amount of information to be remembered when planning, observing, performing, comparing, inspecting, verifying, or evaluating, thereby avoiding dependence on recall.

Checklists are structured in an orderly way, with items appearing in a logical progression, e.g., the sequence in which they are to be considered or performed. Each item is written at the necessary level of detail yet kept as short as possible. A line, box, or the words "yes" and "no" are placed in a column just before or after each item. When necessary, directions are provided on how to use the checklist.

Decision Tables

JPAs that help with decision making where there are options have high payoff potential. They can be used in troubleshooting, repairing, and following instructions and procedures that require decisions. Decision tables are used when a problem includes multiple conditions that influence the proper decision. They prompt the user through difficult decisions, substituting for experience or training. Decision tables generally have one of the following combinations of column headings: (a) IF/THEN, (b) IF/AND/THEN, (c) IF/THEN/AND, or (d) IF/AND/AND/THEN. The IF-THEN rules, by which decisions are made, appear in columns.

Guidelines for developing a decision table are:

1. List (in the **then** column) all possible decisions or actions that could be taken.
2. List in the **if** and **and** column(s) all the conditions.
3. Arrange the conditions and corresponding decisions in a table (most frequently occurring condition to least frequently occurring).
4. Add horizontal rules (lines) to visually connect the words in each column to form a statement.
5. Revise as necessary to assure efficiency and simplicity.

Flowcharts

Flowcharts are graphic presentations of information on what to do and when. They consist of interconnected flowcharting symbols arranged in the sequence in which the various actions are performed. Lines with arrowheads are used to indicate the flow to and from a series of actions (framed in rectangular boxes) and decisions (framed in diamonds). Flowcharts guide the user through an orderly decision-making process to the most appropriate answer or action, based on a series of questions with "yes" or "no" answers. Flowcharts can replace text as a means for communicating complex rules and regulations. Guidelines for a **flowchart** are:

1. Document each action step with a rectangle that is large enough to accommodate the information contained within. The rectangle has one incoming and one outgoing arrow.
2. Document each decision with a diamond symbol. The diamond has one incoming and two outgoing arrows. One outgoing arrow is labelled "yes" and the other "no". Present decisions in descending order of importance.
3. Show symbol-to-symbol (procedural) flow with arrows.
4. Have the main path, "yes" answers to decisions, flow down the page.
5. Revise the graphic presentation as necessary to assure simplicity and good layout.

Preparation

The term job performance aid is most often associated with a printed (hard copy) document that makes use of concise narrative instructions and referenced illustrations to describe the step-by-step procedure for performing a task. One distinguishing attribute of JPAs is that they are equipment or process specific and describe how a task is to be performed on the job. JPAs are therefore tailored to the actual tools, equipment, materials, and processes used in performing the task at the workplace.

JPAs are also useful as instructional aids and reference documents in most formal training courses and programs. When used in this setting, they promote learning and facilitate the transfer of knowledge and skills to the job. Notwithstanding the merits of using JPAs in formal training settings, their special application is with structured on-the-job training and with apprenticeship programs. This is particularly true because of the analytical approach used in their preparation.

Job and task analysis are the basis for determining the relevant behaviors that trainees must be capable of performing. Once it has been determined what tasks are performed, in what manner, under what conditions, and to what standards, JPAs can be prepared. A key point is that the preparation of JPAs is based on job and task analysis information which provides the content, procedural sequence, and so forth. This is more essential to their effectiveness than are layout and format characteristics or the presentation medium, which were found to have no "across-the-board" effect, after an initial period of "getting used to" the format and medium used. Consequently, once job and task analysis information are available, the JPA can be formatted or presented in any way that communicates and is suitable for the learning environment or for use on the job.

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The Challenge of Functional Foreign-Language Literacy: How to Develop Reading-to-Do Instruction in Engineering Education

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Abstract

Technologists read technical manuals and handbooks in a foreign language on a regular basis. Institutions that provide technical education are committed to teaching their students the reading-to-do literacy skills they will need in the domain. Not very much is known about "real-life" manual reading, ie. how the text and the task are processed. The paper presents the core findings of a recent reading-to-do study that was conducted by the author, and gives some outlines for reading instruction. The following suggestions are given for foreign-language teachers who want to meet the challenge of reading-to-do instruction: task-based learning that comprises authentic, meaningful activities; collaborative (pair) activities which make practical problem-solving and reading faster and facilitate synergetic processes; team-teaching for the development of the student's literacy skills across the curriculum. The paper also suggests that classroom activities could explore the reading-writing connection by combining the study of authentic manual texts and the design of technical instructions.

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Technologists read technical manuals and handbooks in a foreign language on a day-to-day basis, as shown in needs analysis studies. To meet the need, institutions of technical education are committed to teaching their students the functional (reading-to-do) literacy skills of the domain (Väänänen 1992). These skills are usually taught in connection with foreign language education.

However, not very much is known about "real-life" manual reading - how the text and the task are processed, and what factors come into play in the context. The purpose of this paper is to discuss the findings of a recent reading-to-do study and to propose ideas for the design of literacy instruction.

The study that I conducted (Johnson 1997) looked into the ways in which pairs of engineering students accessed instruction texts in a real-life setting. In reading-to-do sessions, the participant pairs were required to act upon technical instructions. The selection of participant tasks included installing a bus mouse on a microcomputer, setting the clock and timer of a video cassette recorder, and making an audio recording with a tape deck. A word that best describes the results of the sessions is variation. The tasks took from 9 min. to 1 hr. 20 min to complete and the percentage of session time used for reading ranged from 7% to 76%. The tactics of accessing the manual text varied from step-by-step microprocessing, ie. making sense of the text very slowly, to extremely casual top-down reading. Pair participation ranged from individual sub-tasking to shared problem-solving and negotiation of textual meaning.

Procedural, metacognitive, and content-specific knowledge--either instantiated individually or negotiated by the pair--had a crucial role in completing the task and for accessing the manual text successfully. Depending on individual orientation and the approach negotiated between the partners, the lack of "what-to-do" knowledge could be offset by joint reading, shared problem-solving, and heuristics. On the other hand, if the gap of knowledge between the pair was wide and the individual approaches in reading-to-do were very different, the pair was likely to end up in sub-tasking and a low level of collaboration.

The interplay of the real-world task and reading is best put into the form of a meta-orientation: if you experience uncertainty about the problem you need to solve, seek information to resolve that uncertainty; next, work on the information to construct knowledge which will help you solve for the problem in practical terms. The meta-orientation is *metacognitive*, ie. deals with self-monitoring and evaluation (cf. Block 1986, 1992; Valtanen 1994, 1995). It is also *conditional*, ie. it explicates that information search and construction of knowledge are optional ie. instantiated only if necessary. Finally, it proposes that information search and construction of knowledge for the problem are *interconnected*. The meta-orientation is important as it helps us understand the variation of processes and approaches in reading-to-do.

Current instructional approaches to foreign-language reading instruction are heavily based on a view that componential, "additive" constructs and processes can be readily utilised for reading development (see eg. Grabe 1991, Bernhardt 1991:5-17). These constructs and processes include eg. word recognition; skimming and scanning, or schema activation, and they are derived from cognitive psychology and experimental studies with de-contextualised settings. Similarly, studies of foreign language reading rarely track down reading processes on-line or explore reading development in actual language use (Bernhardt 1991:69).

Reading-to-do literacy and its role in target foreign-language instruction should be reconsidered when validating methods and media in engineering education. I think that a successful curricular design of literacy instruction could be achieved by studying how engineers read and write at work. In other words, we need to identify and "model" the key literacy practices of the engineering community.

A particular type of literacy, such as reading-to-do when installing computer hardware, relates to much more than the linguistic content, mental representations, or reading processes involved (cf. Hutson 1987, Venetzky 1990). The common view that literacy skills are easily transferred from one context to another should be reconsidered and tested. What ultimately boils down to is the function that is embedded in the contextualised situation.

My study showed a wide variation in both the process and outcome. Contextual factors and individual differences came to play in task-and-reading. On the basis of the research findings of the study, what would be an appropriate framework for developing specific literacy instruction?

It seems that the student would benefit from being allowed to develop his/her functional language processing skills in the full context of the task. This would be an alternative to various "activity-driven" approaches with carefully designed student input of linguistic content and learner training that typically attempts to monitor and model the text-processing strategies of the student. I propose a task-based approach where the student proceeds from the whole-task perspective, with instructional exposure and input similar to the real-life context.

Task-based learning (Candlin 1987:5-22) is seen as more motivating and meaningful for the student, and it should compare favourably with the target skills of the specialist domain which the student is being trained for. Materials, media and tools should be chosen that the student is likely to use after training; assessment techniques and student evaluation should support this. Learner contribution in the design stage of the task is highly recommended. But how can the teacher--who in most cases would teach L2 reading in a more piecemeal fashion--manage the (potential) variability of ensuing learning situations and cognitions?

The teacher should tune in for the global aspect. The individual development of professional literacy skills and strategies might be best achieved by promoting context-specific transfer of learning and learner independence. The teacher's main concern would thus be to facilitate the acquisition of literacy practices for successful problem-solving and related cognitive processes. I suggest that a systematic control of how the student processes the linguistic input is not of prime instructional importance.

The tasks assigned to students could be completed collaboratively. The findings of this study indicate that pair collaboration is positive and helpful; it makes practical problem-solving with reading faster, facilitates synergetic processes, and potentially leads to a high amount of shared cognition. In a realistic way, the participants recognise and modify the various roles they have in task-and-reading. The motivation for collaboration seems to be substantial; disagreement on a joint cognitive process is only to be found on a practical issue, not on the foundation of collaboration. The participants also produce a wide range of realistic evaluations about their own and their pair's contribution. This indicates that metacognitive and learning-to-learn skills are naturally acquired in such a setting.

The task-based learning in engineering education requires materials, media, and tools for processing that are rarely to be found in the immediate learning environment of the language classroom. Through team-teaching, teachers could experiment with the introduction and development of literacy skills across the curriculum. This would bring in content teachers with their special professional contributions and enable a more reliable way of recognising domain-specific, context-based discourse practises.

Rather than working from an abstract model of a strategic reader (cf. Rees-Miller 1993), the teacher should set out to establish a climate which supports the development of reading skills as well as roles required in collaboration. It would seem a good practice to observe how the students read and co-operate during the task completion, and to resort to *indirect* rather than direct feedback while the reflective problem-solving process is in progress. This approach would let the practical task "talk" to the student and "teach" him/her.

After completing the task, the students' reading processes could be discussed in the foreign language classroom. A retrospective discussion of how the text was processed should guide the student to improve his/her literacy skills. A useful support for the didactic discussions would be a post-reading questionnaire filled in by the students after the task. It is likely that a majority of students are capable of verbalising their reading-to-do tactics in a meaningful way. Examples of such tactics employed by participants of my study are given in Table 1.

Table 1. *Examples of Participants' Written Answers to the Question "How Should One Read Manual Text, in a Situation Like This?" Reported Immediately After the Reading-to-Do Sessions.*

Students' answers	
1.	Carefully and in an orderly/systematic manner.
2.	Proceed carefully, look at the pictures.
3.	Depends on how your experienced you are; if you do not know much, read carefully.
4.	Use the manual text as a support and as a resource for knowledge.
5.	Look for and read what you need to find following the out headings.
6.	Have a problem (a "question") in mind, when you read.
7.	Read the text so that you understand it.
8.	Read the essential; do not get stuck on every word you do not know.
9.	You should get some knowledge about computer technology.
10.	Get some basic knowledge of the topic.

The curricular objectives of foreign language instruction in engineering education have a focus on technical writing as well. The full scale of domain-specific literacy could be explored by involving the students in a reading-writing connection, ie. in foreign-language instruction where the reading and writing of texts takes place parallelly. Classroom activities could, for instance, combine the study of authentic manual texts and the design of operating instructions for real-life equipment that are available in the language class or in the school premises. It is likely that process writing in a collaborative manner would be especially beneficial for this kind of instructional approach.

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Training Needs in Entrepreneurial Leadership for Women: Cases from North and South

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Abstract

The decision to start a business of one's own is never simple or easy. Entrepreneurship often means long working hours as well as financial risk-taking and can also put a strain on one's health and personal relationships. It is, however, likely that, given the male gender identity and the male domination in the business world in general, the decision to start a business causes more anxiety in women than in men . Women who decide to run their own business face both external and internal constraints. Thus they have to deal with negative attitudes of the community as well as with structural constraints. On the other hand, women are products of their life-experience, often characterized by a value-system favouring abilities that are not readily applicable in the business world. Our objective is to map, through case-study interviews, the constraints faced by women entrepreneurs, to explore the coping mechanisms that they have found helpful and to identify training needs of women leaders and managers. Our case studies come from Finland and Zambia.

Constraints Restricting Women Entrepreneurs

The constraints that women entrepreneurs face can be both external and internal. External constraints have to do with other people's attitudes towards women entrepreneurs as well as with structural forces, while internal constraints involve shortcomings in the skills needed in business on one hand and the gender-related value system on the other. The external and internal forces restricting women entrepreneurs are of course equally important, especially in view of the fact that these factors interact in complex ways. For example, conservative views in the social environment that working women neglect their children often make women feel guilty because such attitudes appeal to the moral imperative to care that women have internalized through their socialization process. Thus, attitudes prevailing in the environment gain get some of their strength through the influence they have on women's value system, which in turn may lead women to conformist decisions about their role in working life.

Even though external and internal constraints are equally worthy of notice when trying to understand the situation of women entrepreneurs , our present discussion will concentrate on internal constraints. The objective is not, however, to suggest that individual women are the core "problem". We believe that many of the internal constraints that hold both men and women back from making nontraditional vocational and professional choices are constructed in gender-related socialization processes and shaped by structural forces (for example the gender system). The purpose of socialization processes is to make us individuals that are both able and willing to play traditional gender roles. The other side of this coin is, naturally, that such processes also tend to make us individuals of the kind that do not have the skills necessary for or interest in making nontraditional choices. Since our aim is to identify women's needs for training in entrepreneurial leadership, in the present study our focus is on internal constraints. Thus, we need to understand how female gender socialization affects women's value system and their entrepreneurial management and leadership skills and their development.

The Gender-Related Value System

Research has shown that there are some persistent differences in the value systems held by men and women (Chodorov 1978, Prokop 1981, Sörensen 1982, Haavind 1982, Gilligan 1982, Waerness 1983, Avotie 1997). Such differences can be seen as a consequence of the sexual division of labour, which leads to differences in men's and women's general living conditions and social experience (Lasonen 1991; 1997). Thus, our gender-related value systems emerge , among other things, from the need of both men and women to have their social experience confirmed. Since working outside the home and being the breadwinner of the family has been an important part of the male gender role, it is important for the male socialization process to prepare men for the values, demands and rules that operate in working life in general and especially in positions of power. Such socialization produces individuals who greatly value their emotional autonomy and who wish to be appreciated for their skills rather than for their personal qualities. It also produces individuals who are emotionally comfortable with circumstances of the kind that characterize hierarchical structures, for example with emotional distance to other people, relationships with power differences and instrumental relationships (Chodorow 1978, Eliasson and Carlsson 1989, Fredelius et al. 1994).

The value system that characterizes women can be related to the fact that women, as a collective, have carried the main responsibility at home - for example bringing up children, managing the social network of the family and maintaining relationships that create a feeling of security and love at home. To develop skills and values (e.g. particular perceptions of morality and rationality) that are needed in such work has become an important part of the female socialization process. An aspect of this is, for example, internalizing values and developing traits and skills that give priority to continuity in human relationships. Examples of such traits are feeling responsible for other people's needs and feelings, valuing reciprocal and unchanging relations with other people and becoming dependent on intimacy and a sense of belonging .

Research has shown that the values and skills needed in working life, especially in managerial positions, match the outcome of the male socialization process (Grant 1988, Acker 1994). It is also often said that hierarchical structures and proceedings are the greatest single constraint on women's success in managerial careers (Grant 1988, Helgesen 1990). This is not, however, likely to become too much of a problem for women entrepreneurs as they can, as founders of their own companies, create a culture and structure that is comfortable in terms of their personal way of dealing with the social environment (Schein 1992). There is in fact a growing body of evidence that women's relational capacity can have very positive effects on organizational productivity. Research indicates, for instance, that women leaders have a tendency to create a social milieu that is less prestige-conscious, more generous and open than is characteristic of male leaders (Grant 1988, Rosener 1990, Helgesen 1991). A milieu of this kind makes it possible to free energy for cooperation instead of binding it up in territorial thinking.

There is, however, one important danger hidden in women's relational capacity and in a value system that focuses on continuity in human relationships. This danger involves a fear for behaviours that might create emotional distance between oneself and other people (Margolies 1988). There are similarities between the relational orientation found in "female culture" and what is called the "need for affiliation" in management literature. A strong need for affiliation has persistently been found to be correlated negatively with managerial effectiveness (McChelland and Boyatzis 1982, Youkl 1989). It can, among other things, lead to situations where managers avoid making necessary but unpopular decisions and using their authority because they are afraid of creating distance in their relationships with their employees. It can also lead to a situation where the manager's relationships with her employees are so close that they undermine her authority. A relational orientation can thus cause confusion between personal and professional relationships which might severely harm the productivity of the company, for example by leaving the subordinates feeling weak, without responsibilities and without a sense of what might happen next or where they stand in relation to their manager (Youkl 1989). It might also become a severe source of stress for the manager herself unless she learns to handle the distance which is a natural part of professional relationships. Another source of stress for women is their preoccupation with how their own behaviour might affect other people. For women entrepreneurs the most important other people are their subordinates on one hand and their children on the other.

Skills Required

For an entrepreneur it is very important to have the necessary task-related skills (Miner 1977). However, it is equally important to be able to handle organizational conditions and other requirements entailed by a business. The present discussion concentrates on two extensive areas of competence that are important for an entrepreneur, task-related competence and managerial competence. Task-related skills include basic technical knowledge of production processes as well as general contextual knowledge. As the role of an entrepreneur is to seek opportunities and problems both inside and outside the organization and to take appropriate action, it is crucial for her to have, besides the relevant technical skills, knowledge of the way of doing business in the economic sector in question.

An entrepreneur is not just an expert in the field but also a leader/manager of a business. What skills are actually included in managerial competence varies, but traditional management research usually discusses the concept in terms of skills involved in planning, solving problems/making decisions, organizing and controlling. In contemporary research these skills are often referred to as traditional leadership qualities. Since a manager can be defined as an individual who achieves goals through other people (Robbins 1996), contemporary management research focuses strongly on interaction with other people. Skills like "routine communication", "networking" and "human resource management" are considered to be seen as important as traditional management skills (Luthans et al. 1988, Hunt 1991).

When we come to the question of whether women have or lack some of the skills mentioned above we must first consider the background of the given individual. It is of course likely that highly trained professional women with managerial experience have better knowledge of managerial functions that do those women who start their own businesses, for example after losing a less qualified position. Even task-related competence depends on the individual's previous training and experience. In terms of the division of labour between the sexes, however, women's knowledge often lies in the traditional female fields.

It should also be mentioned here that because of the typical female perceptions of human relationships, women often miss the importance of political manoeuvres. Political activities are based on a recognition of the fact that there are different interest groups and coalitions that affect the given organization. Political competence includes the ability to create and use informal contacts and networks, the ability to convince other people and the ability to read the political landscape.

Case Studies

Our objective is to conduct interviews with women entrepreneurs and, in line with the above theoretical framework, to find answers to the following questions: What kind of decision-making process preceded the informants' start of their own businesses? What are the underlying principles and values that govern and motivate their business activities? What kind of risks have these women encountered? How did they handle the risks, what were their coping mechanisms? What aspects of their work cause stress? What have they learnt as entrepreneurs? What kind of training needs do they identify?

Ten women entrepreneurs will be selected from each country. In Finland we will recruit our informants through the Women Entrepreneurs' Association and in Zambia from among rural and urban women taking out formal medium-term loans from banks operating in Luapula province. The main goal is to explore the variation in the risks women leaders face, the coping strategies they adopt and the needs for training that could assist them in their leadership role identified by them. The main criteria for selecting the women leaders who will be our informants include the size of their business and the duration of their leadership period. In most cases women are leaders in small and medium-sized businesses and our criterion is that the business employs at least five people. To follow the process of developing as a leader another selection criterion is that the woman has been leading her own business for at least five years. The interviews will be analysed against the background of the framework and research questions explained above.

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Qualifications with a Dual Orientation to Skilled Work and Studies - Innovative Schemes of Seven European Countries under Investigation

Presentation of the LEONARDO Survey and Analysis Project INTEQUAL

Proposal for a Symposium at the IVETA '97 International Conference on Vocational Education and Training in Helsinki, Finland, 24 - 28 August, 1997
(26 August, 3 to 5 pm)

by

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Qualifications with a Dual Orientation to Skilled Work and Studies - Innovative Schemes of Seven European Countries under Investigation

(The underlying project INTEQUAL is carried out with the financial support of the European Commission in the framework of the LEONARDO DA VINCI programme.)

Summary by *Sabine Manning et al.*, Research Forum WIFO, Berlin

Outline of Presentation

The presentation of the project INTEQUAL begins with a comparative analysis of national schemes of dual qualification (*Manning*). This is followed by a more detailed investigation of three transnational issues of dual qualification:

- integrated learning processes (*Larsen & Liljefelt*);
- supporting transitions to higher education (*Brown & Moerkamp*);
- tracing careers (*Kusch*).

Finally, conclusions are drawn about the potential of collaborative research under Leonardo (*Manning*).

Survey: Innovative Schemes of Dual Qualification in Comparison

One of the basic issues in vocational education and training in EU countries, highlighted in the action programme LEONARDO, is how to increase the attractiveness and status of initial vocational education and training. Essentially, this is a question of improving the quality of vocational education and training.

A specific approach initiated in a number of countries is to provide the option for trainees or students of vocational courses to acquire qualifications for university access alongside their vocational qualifications. This is based on varying degrees of combination or integration of general and vocational education. It is connected with efforts to achieve parity of esteem between vocational and general education, and between work-based and knowledge-based learning.

The resulting qualification has a dual orientation towards employment and higher education (dual qualification). The present project focuses on an in-depth analysis of a selection of recent schemes of dual qualification which have been implemented in seven countries of the EU and EFTA. The schemes are characterised by features including the following:

(A) Dimension of the schemes within the education systems. According to this criterion three groups may be distinguished:

1. Schemes which extend over an integral part of the whole educational sector such as the vocational programmes or streams within the comprehensive school systems of Norway and Sweden;
2. Schemes which refer to individual courses or qualifications, e.g. the Vocational Baccalauréat (Bac Pro) in France, the General National Vocational Qualification (GNVQ) in England, the long courses of senior secondary vocational education (MBO) in the Netherlands and the WIFI Academy courses in Austria;
3. Schemes representing pilot projects within the established systems of vocational education and training (Germany: Bavaria and Brandenburg).

(B) The balance of dual orientation. While all schemes allow for a dual orientation, they differ in the relative weight attributed to either employment or higher education. Several of them put the emphasis on employment as the prior aim (the schemes in Austria, France, the Netherlands and Sweden). This is likely to apply to the vocational streams in Norway as well, although the Reform 94 aims at a balance of the two orientations for the total provision of upper secondary education. The two remaining schemes (in England and Germany) imply a fairly equal weighting of the two progression routes.

(C) The level of vocational training / the target groups. Most of the schemes (in England, Germany, the Netherlands, Norway and Sweden) are part of the initial vocational training which is provided at upper secondary level for 16-19 year olds. The English, Norwegian and Swedish schemes are also open to adult students. The French scheme is specific in offering advanced education and training for students who have already completed initial vocational courses or certain stages of them. In Austria, the scheme is exclusively geared to adults who are already qualified in a vocational area.

Several aspects of the structure, contents and didactics are relevant for the schemes of dual qualification:

> **Flexibility in curriculum design**. Flexible structures of the curriculum, with a frequent use of modular patterns, have been introduced in the

schemes of several countries. They are above all intended to connect and in part integrate general and vocational subjects or units of learning.

> **Emphasis on developing personal competence.** Several concepts and terms used in the various national schemes centre on a new approach to learning which aims at developing personal competence in a complex and active way and which goes well beyond the division into general and vocational abilities.

> **Collaborative work of teachers.** The integration of academic and vocational qualifications calls for a closer cooperation between general subject teachers and vocational teachers. These two categories of teacher represent different backgrounds and traditions, so that the functional integration of teaching is difficult to operate. In addition, the teacher in an active learning environment takes over a new function as adviser rather than instructor and has to cope with independent-minded students who have a say in their own learning process.

> **Cooperation between schools and enterprises.** Most of the schemes link school-based and work-based learning, including mandatory practical assignments (France, the Netherlands, Sweden), supplementary ones (England) or traineeships (Norway, Germany). This approach implies a need for functional cooperation between schools and enterprises, and between teachers and trainers or workers.

A key question which has accompanied the whole investigation is the extent to which vocational and general education are or can be integrated. The comparative analysis takes account of two dimensions which are assumed to be relevant for the qualifications with dual orientation: (I) the relationship of education and training to skilled work and (II) the relationship of general education to vocational training.

The curricula of the schemes provide for a variety of combinations involving vocational and general education, ranging from the additive to the integrative type of approach:
(A) Separate general/theoretical subjects;
(B) Vocational application of general/theoretical subjects;
(C) Education and training related to transferable skills;
(D) Action-orientated education and training (projects).

The conclusions drawn from the comparison include the following points:
There is, altogether, an emphasis on the additive combination of vocational and general education (A), with the latter being extended particularly in individual options. Three schemes focus on this (Sweden, the Netherlands, Norway), and most of the others include it as a vital part. The relevance of the additive combination seems to be fairly independent of the scheme's relationship to skilled work.

Next to this, the vocational application of general subjects as the first stage of integration (B) is relevant, both as a focus (England, Germany: Bavaria) and in combination with other stages of integration (Austria, France). The relevance of applied subjects can be observed in schemes with differing relations to skilled work.

The advanced stages of integration - training related to transferable skills (C) and action-orientated education and training (D) - are characteristic of two schemes (Austria, Germany: Brandenburg) which have, at the same time, the strongest relation to skilled work. These schemes display the potential of work-based education and training for the development of transferable skills, including study skills. Advanced forms of integration, particularly project work, are also represented as components of all the other schemes.

The evidence suggests that several ways of combining general and vocational education (A to D) are fairly independent of or easily adaptable to different categories of courses. If this proves to be the case, it suggests that there is considerable opportunity for exchange and transfer of experience across schemes and national systems.

It is also apparent that the schemes of dual qualification, in this specific function and in their national context, apply or indeed create both innovative course structures and curricula and didactic approaches, all of which are of wider significance for qualitative advance in vocational education and training.

Issue 1:
Integrated Learning Processes

The theme of this paper is a preliminary presentation of findings which focus on learning processes with empirical references to some selected learning situations. The partners from Germany, Norway and Sweden present case studies and other relevant empirical data, and discuss the research question with reference to institutional factors and theoretical points of view.

The problem under discussion is how to promote dual competencies and integrated learning processes.

To start with, differences in the education systems in the three countries need to be considered. These differences set limits to what can be studied, but also offer interesting points for comparison. However, on most issues or variables of relevance in this study, the Swedish and Norwegian systems are comparable also because the cases chosen for investigation lie within the ordinary school system.

The Swedish schools in the material have originally been chosen by the Swedish Department of Education as reference schools in a national evaluation programme. The Norwegian cases have been chosen in order to study project work as a way of working with integrated learning processes.

These two countries have both been through senior secondary school reforms of far-reaching significance for the vocational streams. The question under consideration in studying these two systems is the extent to which a reformed educational system promotes the development of dual qualifications, and how the system provides for integrated learning processes.

The national studies offered a documented framework (goals, syllabuses and timetable) for the provision of dual qualification and integrated learning processes. They also suggested possible problem areas to be dealt with. The focus of this presentation will be the relations between learning situations and the learning outcome.

The German system is different from the Scandinavian ones. Consequently the possibilities of comparison at school level may not be so obvious. Even so, the particular German (Brandenburg) model chosen for this project also aims to overcome the basic division between vocational and general education, and to offer attractive educational possibilities to young people. The German case study is a pilot project («Schwarze Pumpe»), where the researchers have the opportunity to plan for the learning processes and to study the results closely.

These case studies may be of interest at two system levels:
(1) the organisational level of schools;
(2) the organisation of teaching /learning situations at classroom/workshop level.

The presentation will focus on the second of these with reference to the following key question: What methods generate conditions for students to develop integrated qualifications?

At the classroom or workshop level the partners looked into how teachers organise the learning conditions between and within subjects. The main focus is to identify methods that generate integrated learning processes (and produce integrated competencies). A basic assumption will be that certain teaching methods generate favourable conditions for students to develop integrated competencies. One important learning approach thought to generate such learning /competencies is centred on task-, problem- and project-based methods.

In this study the three partners provide different cases, also respecting teaching methods. The Brandenburg model has been designed as an innovation programme based on work activities as the foundation for developing conceptual frameworks (knowledge/theory/ Gestalt). The Norwegian cases mainly focus on project work situations. The Swedish cases focus on different teaching methods. In analysing and comparing these different cases /teaching strategies from the perspective of learning outcome, the different cases can function as dependent/independent variables according to the focus chosen in each case.

Research methods include observations, interviews, questionnaires, matching different models of organisation, methods of teaching.

Issue 2:
Supporting Transitions to Higher Education by Students from Vocational Pathways

This investigation is being carried out by partners from England and the Netherlands. In both countries those coming from vocational pathways are more likely to drop out of HE than those coming from general education. As part of the European Leonardo INTEQUAL study of integrated qualifications, the researchers investigated the steps that could be taken to increase the likelihood of students from GNVQ and MBO, in England and the Netherlands respectively, being successful when they move into HE. These steps included

- setting up partnership or compact arrangements between institutions in the two sectors;
- offering specially enhanced or enriched GNVQ or MBO programmes; and
- paying particular attention to the development of those skills and qualities associated with being successful in HE.

The researchers draw their findings from their own research on recent developments in the relationship between MBO:HBO and GNVQ:HE, particularly in relation to curriculum development in the areas of health and social care, engineering and business studies. This research is coupled with secondary analysis of research on the knowledge, skills and personal qualities required to be successful in HE, and a consideration of how to increase prospects of progression to HE while also maintaining an orientation towards the labour market as a fundamental aspect of a qualification with a dual orientation.

Issue 3:
Tracing Careers

The partners from Germany (Bavaria), France and Austria are tracing the career paths chosen by participants who have attended educational institutions leading to a dual qualification. The dual qualification route involves educational pathways which in addition to offering certification in initial or further vocational training, also offer a university entry qualification. This qualification is attained in the German (Bavarian) pilot project within the "dual vocational education system" ("dual" with the different German meaning of VET provision at both enterprises and schools); in France by way of state sponsored full-time educational pathways and in Austria by a supplementary training programme. The goal of the investigation is to determine to what extent pathways of vocational dual qualification influence graduates' subsequent career paths.

One focal point of the investigation will lie in the assessment of the percentage of graduates entering industry related jobs as against those choosing to pursue university studies.

The evaluation will draw on results stemming from research data compiled in the afore-mentioned states. The French data is taken from a poll that interviewed approximately 3000 graduates who attained the "Baccalaureat professionnel" in 1992. The German data comes from evaluative supervision management investigations conducted within the context of the Bavarian pilot project of dual qualification "Duale Berufausbildung und Fachhochschulreife", with approximately 100 participants. It is anticipated that this Bavarian pilot project will run at least until the year 2001. By the summer of 1997, approximately 100 participants with commercial-technical vocations will have completed their dual training, and will have qualified to attend a German Fachhochschule (institute of higher learning combining academic studies with practical work experience). In contrast to the French as well as the German students, the Austrian participants are being trained at WIFI-Academies (specialized economic colleges), and attend evening or weekend classes while working full-time. Approximately 60 Austrian questionnaires will be drawn on and included in the joint evaluation process by mid-summer 1997. The evaluation aims at pinpointing culture-specific as well as transnational findings.

An important fact to consider is that the Austrian WIFI-Academies do not constitute educational pathways (institutions) sponsored within the framework of a state sponsored school administration, but instead comprise educational opportunities offered by private enterprise on behalf of Austrian industry.

Moreover, while the French and German training pathways were designed for youths within the framework of vocational and general (mandatory) initial education, the Austrian paradigm is one offering supplementary education for "mature" skilled workmen (adult education - the average participant being 25 years old). The educational contents and demands placed on the participants differ accordingly.

The following pieces of data concerning the groups under investigation need to be evaluated by mid-1997:

> **Individual personal data and evaluations upon completion of dual-qualifying education** (gender; age; previous educational level; previous vocational training; if relevant, choice of field upon university registration with desired end-result; if relevant, field of employment entered; evaluation of the dual qualifying educational measures;

> **Data on dual qualifying educational measures** (factors which motivated participants to participate in the dual qualifying measure; number of years that lie between the last educational or vocational training and the entry into the dual qualifying course; parents' educational background;

> **Empirical data on dual qualifying educational measures** (total number of national participants -as of May, 1997; effects the dual qualifying educational measures have had on the standard traditional educational system.

Outlook: Potential for Collaborative Research under LEONARDO

To conclude the presentation, some aspects of the methodological approach in this project are highlighted.

The project, being supported for a two-year period, has a two-phase structure: The first phase (year 1) preparing national case studies leading to a transnational comparison; the second phase (year 2) carrying out topic studies in teams.

The **first year**, which centres on national case studies and comparison, is intended to lay the basis for partnership research:

- The central concern of the project has to be identified and investigated in the national context. This analysis is guided by a joint set of research questions which leads to a common structure of the national case studies. By doing this together, for instance in team work, the partners not only learn about each other's education system, but also learn to look upon their own system in a transnational context.
- The comparison highlights differences and similarities of the systems/phenomena, and alternative ways in which the countries

concerned aim at the same objectives. As a result, systematic information is produced and questions for joint research (second year) can be defined more precisely.

The joint analysis in the **second year** centres on several studies. In both cases, partners of two or more countries work in collaboration on selected issues and according to a joint research design. The project includes joint studies on the character of the learning process, on the assessment of competence and on patterns of individual pathways and guidance.

In view of the short period of time available for the project, the joint research, wherever possible, builds on up-to-date national investigations. For instance, for studying learning processes (issue 1) national pilot projects already under investigation are being included. The work on the skills to be successful in higher education (issue 2) will draw on existing studies and involve mainly secondary analysis. Or questionnaires carried out in the countries involved (issue 3) form the basis for preparing joint interviews related to selected aspects of investigation.

A major aim of the project is the transfer of ideas between researchers, politicians and practitioners. This is pursued as part of the approach in both phases (years), e.g. by carrying out interviews with experts/politicians in preparing the national case studies, by focusing questionnaires on students/graduates of the schemes, and by presenting interim findings at workshops with politicians and practitioners.

What are the characteristics of the kind of partnership project outlined above? It may be helpful to distinguish between **what** is done in the project and **how** the partnership operates.

What: The investigation progresses from national studies to transnational comparison and then to the investigation of issues which cover several countries. Experience from this project suggests that each of these stages has a purpose of its own and a specific place in an order of inquiry. In particular, the joint investigation of selected issues across countries presupposes a close knowledge of national cases and their comparative assessment.

How: The degree of collaboration proceeds from relatively separate individual work to team work and total partnership work (the latter operating in alternation or combination). The individual work of partners is already distinguished from ordinary national research in that specialists from each country contribute to the joint project and are guided by the partnership.

Team work as well as work in the partnership as a whole operates in both comparison and cross-country investigation. Collaboration in small teams gains from a close knowledge of each other's system, methodology and experience. Joint work in the total partnership, in contrast, requires a high degree of adaptability among all partners, an efficient mechanism for communication and a considerable amount of overall coordination.

National studies and transnational comparisons carried out by individuals or teams in a coordinated framework have already been established as an approach typical of CEDEFOP and OECD projects, while transnational investigation pursued by a collaboration of partners (**collaborative investigation**) is likely to be a major characteristic of LEONARDO projects. However, this particular approach presupposes joint comparative work as a preparatory stage.

The research pattern described above may be limited in that it applies to certain themes and situations only, and even in this context there may be alternative approaches. It would, therefore, be worthwhile to set out distinctive patterns of research developed over a broad range of LEONARDO S & A projects. The European-level project EUROPROF, for instance, involves quite a different methodological perspective. A discussion on these approaches could provide useful input for subsequent project proposals.

A crucial question concerns the impact which LEONARDO S & A projects may have beyond the two years in which they have been supported. There is little chance of prolonging the total partnership and overall coordination outside the framework of EU support. What can survive and be developed further, however, is the maintenance of collaborative links between teams of partners who have been able to establish common ground in terms of research areas and mutual support. This is, again, the special effect of setting up partnerships in small semi-independent units from which grass-root initiatives can emerge.

Another effect is the development of a network of researchers in the context of different projects. This, however, is dependent on a specific framework of initiative and support. There have been wide-ranging ventures by CEDEFOP (Pekka Kämäräinen) for several years, and this LEONARDO workshop points to the possibility of extending the dimension of such activity.

Interim results of the partnership project:

Manning, Sabine (Ed.): Qualifications with a dual orientation towards employment and higher education: a comparative investigation of innovative schemes in seven European countries. Berlin: Wissenschaftsforum Bildung und Gesellschaft e.V. (WIFO). November 1996

PART III

OPPORTUNITIES TO ENRICH VOCATIONAL EDUCATION AND SKILLS TRAINING THROUGH APPLICATIONS OF THE PHILOSOPHY AND METHODS OF ADULT EDUCATION

Adult Learning in the Vocational Education Context

- Issues of Destinations and Journeys

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Abstract

This short paper represents an exploration of certain assumptions, concepts and terms. It seeks to clarify their meaning in order to be able to relate them with consistency. It will also attempt to show how these concepts underlie teaching and learning practice in the "vocational" education field, whether they are explicit or not. In the light of the nature of and the processes of adult learning, "destinations" will be explored in relation to issues of outcomes and competence and assessment. In similar context, "journeys" will be explored in relation to the appropriateness of curriculum approaches and learning programme structures. The paper will finally attempt to show how the proposed understanding of the concepts and their relationships may bring about modifications in the teaching-learning process that will enhance the "adultness" of the pressures and the quality of the capability that is achieved.

Note: *In the presentation at the Conference, the interpretation of the concepts and their exploration will be illustrated in graphics and with examples.*

Adult Learning - The Adult Learner

From the title it is clear that the two areas of concern that are brought into juxtaposition are those of "adult learning" and "vocational education".

From the work done by Malcolm Knowles with regard to the adult learner it was assumed that adult learning approaches and methods (andragogy) was the opposite of child-learning (pedagogy) and that, when working with those who in physical age were not children, the preferred approach was the andragogic. Subsequent writers have challenged and modified this view, and, in the opinion of this writer, correctly so. Much of the earlier work sharply contrasted the one with the other and implied that the choice for the educator was to use adult learning approaches and methods or not!

This false antithesis fails to perceive that the issue is better expressed as positions along a continuum. (In the presentation, this issue will be discussed and illustrated.)

Perhaps even more importantly, the issue is about adultness meaning self-directedness rather than adultness in terms of biological age. This issue of self-directedness is influenced by many aspects of the history of the learner and of her/his development. It would seem to this writer that the central psychological factor is that of locus of control. Those with a highly developed internal locus of control will be increasingly or appropriately self-directed whereas those with a strong external locus of control will seek teaching/learning styles and experiences and materials that are teacher/trainer controlled.

Teachers and trainers who have made sudden conversions of their own teaching-learning methods from predominantly pedagogic to predominantly androgogic have frequently been confused by the distress or disempowerment that the presumed "better" approach has caused in learning. In societies where family cultures and/or political cultures are or have been strongly autocratic and dictatorial, learners will only gradually be helped towards self-directedness.

I therefore conclude that each adult learning principle needs to be qualified by answers to questions and as: "to what degree?", "in which circumstances?", "for which types of learning?", "at what stage in their development?" and so on. This will be further elaborated upon in the presentation.

Education - What Makes It "Vocational"?

Much of the literature on this subject tends to assume that what is meant by "vocational education" is common knowledge. It is clear that the notions of 'work' and 'learning' are brought into close interaction and this seems to be central to what type of education is "vocational"?

In my own country education or training that is termed vocational takes place either at work (on-the-job), or on employer's premises or at institutions such as "Technical Colleges", "Technikons" or "Training Centres". Education that takes place at school is termed 'general' or on occasion, 'academic' and that which takes place at University is always termed "academic". In the tradition we have followed there would be in the engineering field, for example, a heavier "theoretical" emphasis or component to a University course and a heavier "practical" emphasis at the Technikon.

These observations lead one to conclude that we use the terms "academic" and "vocational" primarily with regard to the sites of learning and or even the type of qualification gained and miss the opportunity to distinguish between differences in the nature of learning itself. May there not be merit in thinking about the learning that takes place in terms of context rather than content? Learning which is placed solely in an abstract or non-specific context will be different from that which is placed in a specific context - be that a context of anticipated application or of actual application. Nor are differences in application only a matter of time delay. It has also to do with range of contexts.

If there is merit in such a position (examples will be given in the presentation) then what should be happening in learning and teaching should not be focused on 'where' it is taking place but rather focused on the appropriate description of the context or contexts in which this learning is placed? Such learning may generate the appropriate and desired levels of task performance, of cognitive performance, of reflectiveness, of mastery of content. Such an approach would then move away from assuming that there is an arithmetic balance between 'theory' and 'application' and seek to redefine the learning and its context. This, in turn, will help to define what theory and what application is relevant. (Examples will be provided.)

The Destinations

What are the destinations of successful adult learning in vocational education? The easy and trite answer is "passing the exam", "passing the trade test", "getting a job". Such destinations are relatively easy to administer, can be the source of educational production statistics, but do they say enough or even anything significant about the nature and the quality of the learning and the abilities, the skills, the competencies that have been acquired?

All recent legislation to do with a South African Qualifications Authority (SAQA) and a National Qualification Framework (NQF) and the specific legislation and draft legislation for education and training has the notion of "outcomes-based" as its central focus. Statements of outcomes therefore become the description of the destination of learning, of the ability evidenced and assessed. Around this notion, "outcomes", has developed a heated debate and various groups have taken up either supportive or antagonistic positions. Yet others do not even enter the debate and simply look for formulas or at least formats for writing outcomes and translating these into Unit standards which are the building blocks of the Qualification Framework.

Is an outcome statement the same entity as a description of competence? In our experience an outcome statement is usually a statement of performance expressed as "is able to ...". In some practices, there is a degree of the integration of understanding and application or the use of that understanding.

Some of the qualities required of an adult learning approach, as expounded initially by Knowles, relevance, immediate application, objectives, feedback and expectation.

These items seem to imply that the destinations of learning either as products within formal learning environments or as products in work application, need to be expressed more as competence statements than as outcome statements. In the observations of this writer outcome statements seldom have clearly indicated contexts or clearly delineated standards of performance.

I wish to propose a definition of competence that arises from a view that competence is multi-layered. It has to do with performance; with the understanding necessary for the performance and the understanding of the performance itself; with understanding the system, the context, within which the performance takes place and, finally the opportunity to innovate. Such expressions imply the commitment of the person to the performance, of giving value to the performance. Following the line of thought I propose that competence be defined as: a skill or cluster of skills, executed within an indicated range (context) to specific standards/criteria, of performance, of integrated knowledge/ understanding, of understanding the system, of ability to transfer the skills to other related contexts.

It would seem that such an understanding of competence requires an understanding of the term skill to be no less than "a generalised performed capability in any domain of human performance".

If this view of skill and of competence has merit then I submit that the distinctions between 'academic' and 'vocational' as traditionally used, are not helpful. It also raises the relationship between 'performance' and content. This will be explored a little later.

Such a position as expressed above would imply that traditional norm-referenced approaches to assessment are problematic and modes of continuous assessment and of assessment and feedback against indicated criteria within appropriate contexts need to be developed and used.

The Journeys

An advertising slogan used at one time in my country stated "Success is the destination, not the journey". Some would assert that this is what outcomes-based education or competency-based education and training are in fact asserting. In the application of some practitioners this distortion may be seen, but it surely is a distortion.

If the journey is as important as the destination, what types of learning journeys will adult learners (of whatever age) find enriching, developing and effective? This question implies that we reassess our fundamental approaches to curriculum design and development and the range of teaching-learning options open to us.

Kelly has suggested that there are typically three broad approaches to curriculum namely; curriculum as content, as product and as process. He suggests that if one views curriculum as content then one will view education as transmission; if as product, then one will view education as instrumental; if as process, one will view education as development. In the education of young adults and adults (speaking in biological age terms here) in my own country, we have tended to move from one of those approaches to the other, rejecting the earlier approach each time.

Is there a more fruitful way to view curriculum and the education and training process? It is my conviction that the notion of praxis provides this integrative and integrating perspective. In its philosophic position described and relevant characteristics explored.

Whether such a view of curriculum is consistent with the view I have put forward on competence will be discussed and illustrated in the presentation.

What of the structures and methods of teaching-learning programmes? Other characteristics of the "adult learning" approaches which are pertinent here include: a climate that is free from anxiety, and is open and accepting, the opportunity for the learner to experience the satisfaction of expectations or needs, the opportunity to learn in self-directed patterns, and in a self-paced mode, to experience feedback as a two-way, standards-based process.

How, the individual, or even certain relatively homogeneous groups, would be placed on a continuum for each of these aspects and, hopefully, be facilitated to move progressively towards a more 'adult' experience of learning will be discussed and illustrated.

How may such a view of "competence" and such a view of curriculum approach deal with matters such as

- the role of content, or of the subject discipline?
- the type of focus - whether it be predominantly "theoretical" or "practical"?
- the role of vocational education to build both the technical/trade skills of a country while developing critical thinkers?

These will be explored in the presentation.

Where is the sharp dividing line between 'academic' and 'vocational'? Is it disappearing? I will contend that it may become healthily vague with appropriate understandings of competence, curriculum and adult teaching and learning practice.

Shaping the Work Life - A Future Oriented Way of Lifelong Learning

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Abstract

Lifelong learning is said to be of growing importance for the "knowledge based" society of the future, the reason mostly given for that being higher demands at the work place. Adult education for personal self-fulfilment and educated citizenship is, for the market driven society, no longer highly valued. "Shaping the work life" is presented here as a guideline for continuing and initial vocational education and training which aims at improving competencies for new work tasks and, at the same time, fostering personal independence. In this way, both the interests of the workers and those of the employers can be, if only partly, reconciled. By that, goals like the learning organisation and the learning region could be achieved. The approach could even, in the long run, aim at taking the catchphrase "learning society" seriously. Some characteristics of learning environments facilitating this approach are presented in the paper.

1. Introduction

In many European countries, there has been a major shift in adult education from more "general" activities to the area of gainful employment. The reasons for this can be found in two developments. On the one hand, economic recession has led to growing unemployment which has enhanced the necessity of measures for retraining workers made redundant. In addition it is thought that human resources are of growing significance for fostering economic growth. On the other hand, the ideals of educated citizenship and personal self-fulfilment which had been very important for "general" adult education have lost much of their attraction, due to considerable changes in the "Zeitgeist".

Whilst growth in spare time had, more than two decades ago, strengthened the ideal of self-actualization outside the world of work, in pursuing social and artistic activities, neo-liberal thinking nowadays stresses the importance of achievement within the area of paid employment. Likewise, educated citizenship seems not to be as highly valued as before because market forces are often held to be the most effective means of promoting the well-being of the community, in contrast to public discourses informed by arguments founded in overarching reason.

Although it is indisputable that adult education has to accommodate changes in the world of work, perhaps more intensely than before (Langlo, 1993), nevertheless the aim of furthering self-fulfilment which is not confined to working life and, even more important, educated citizenship should not be waived. Therefore, it would seem necessary to search for philosophies and methods of adult education which at least are able to combine occupational and "general" goals even if it may not be possible to reconcile the two. To this end, "shaping the work life" is suggested here as a guideline for adult education related to gainful employment. In the context of lifelong learning this must, of course, have considerable consequences for all areas of vocational education and training.

2. Growing Importance of Lifelong Learning

Lifelong learning is nowadays one of the most frequently referred to ideas within discussions about the future of modern societies which often are referred to as "post-industrial" societies. Even if one does not agree with predictions of the emergence of an "information society" it seems obvious that the role of knowledge is growing. This is said to be especially true for the expanding services sector although the predicted trend towards a "services society" may be likewise disputable, depending of course on the meaning of this catchphrase. Certainly "secondary" services which support the production and distribution of material goods, e.g. banking, insurance, management, consultancy, transport, wholesale and retail trade, advertising and so forth, are gaining more and more importance. This in turn leads to a greater percentage of work tasks which deal with immaterial symbols as compared to material objects, that is, which probably require more symbolic knowledge, although often not of a very complex kind. To describe this development in a distinct way the European Commission characterises the society of the future as one which is "knowledge based" (White Paper on Education and Training, 1995). The pace of change leads to growing importance of adult learning which is epitomized in the notion of lifelong learning.

If this argument is true for changes in the overall composition of economy it should apply to changes at an intermediate level too. The relative importance of different occupational areas is changing, as far as the size of the manpower employed is concerned, shifting from traditional industries to the above mentioned fields so that workers who have been made redundant have to be retrained. Within these sectors, too, there is a shift from more simple (often manual) jobs to ones which are more related to symbols and sometimes to more complex symbolic knowledge. But even on a micro-level, regarding the composition of existing work tasks, there is a major change. The main reason usually given is the implementation of new technology, be it on the shop floor or in office work. Of similar significance, however, are changes in work organisation aiming at enhancing the effectiveness and flexibility of work processes, in view of shortening product life cycles and higher standards for quality assurance.

It must be noted, however, that especially in this case the new requirements do not mainly, as is often said, encompass more and more abstract, symbolic knowledge, e.g. of the technology employed. Complex knowledge about how to handle the work process as a whole with its unforeseeable features, especially in "crash situations", is necessary. Here the development of core skills and key qualifications, including problem solving, creativity and communication skills, comes to the fore. These should, however, be combined with knowledge of the content of the respective task, in this way forming complex "work process knowledge". This opens up new perspectives for adult learning as well as for the whole field of vocational education and training.

3. Perspectives for Adult Education

New forms of work organisation have led to new conceptions of adult education with regard to the working world (Dybowski, Haase, Rauner, 1993). The former encompasses work teams with flattened hierarchies and closer links between producers and customers which affect also shopfloor and office work not directly connected to customers.

The main feature of these new conceptions is a focus on learning directly at the work place, embedded in the day-to-day work process. This permanent learning preferably takes place in teams which may be the actual work teams or groups especially formed for solving problems in the ongoing work process. Here the tradition of "quality circles", originating in Japan, comes in. These can and should, as will be stressed later, be transformed to "shaping circles" that are established for permanent action towards improving work organisation and job tasks, not only for higher productivity but also for better working conditions, and including job enlargement and job enrichment, with a greater scope of responsibility and more stimulating tasks (Heidegger, Rauner, 1991).

If these forms of permanent learning encompass, on a systemic level, the whole enterprise it is appropriate to call it a "learning organisation". According to the idea of the whole being more than the sum of its parts it is reasonable to employ the term "organisational learning", meaning the learning of the organisation as a whole, which contains the learning of the individuals but, at the same time, transcends it. Organisational learning is at present a major point of interest for research in human resources development as well as in continuing vocational education and training (Burns, Flam, 1987). This idea is also being applied to connections between suppliers and customers forming so called "production chains". These also can develop organisational learning of a higher order which should improve overall productivity and, in the end, lead to economic growth. If regional networks of such production chains, often mainly encompassing medium sized enterprises, are emerging it is appropriate to talk about them as constituting a "learning region". To support European regions in becoming "learning regions" is a main aim of the European Commission which expresses the hope of this process being a major means of countering unemployment and fostering social inclusion so that what is sometimes called the "social organisation of innovation" can result. It is obvious that continuing vocational education and training plays an important role in this process, possibly leading to the development of new forms and content for both adult learning and initial education and training. Perceived in such a way the term "learning society" which is often used in connection with the "knowledge based society" of the future might attain some real significance.

4. "Shaping" the Worklife - A Guideline for Lifelong Learning

Although at first sight these developments seem to indicate a spontaneous development towards more human centred working conditions there is missing a decisive aspect. Whilst learning constitutes in itself an important value for personal self-fulfilment nevertheless there has to be asked what this learning is aiming at. It is exactly this question which is usually not asked because the answer is taken for granted. The mainstream arguments presented in the literature emphasise technological and economic determinism. There is said to exist a continuous outflow of new technologies which change all kinds of industries, by that determining altered work tasks and creating new ones. In addition, the diagnosis of "globalization of economy" leads to the assertion that new forms of work organisation have to adapt to the demands of global competition. These are said to consist, for the highly industrialized countries, of customized small batch production and high quality standards which can be met only by decentralisation of responsibility, in team work with flattened hierarchies and high flexibility of the work force. So the conceptions of learning organisation and even of the learning society are taken as being merely instrumental for economic competition, between enterprises, nation states and between the triad of the USA, Japan and Europe.

Correct as all these arguments, at least in part, may be, what is wrong about them is the contention that there is only the one and best way of meeting the new economic requirements. There is ample historical evidence (Noble, 1984, Bijker, Hughes, Pinch, 1987) that there are always alternative ways to employ technology and, moreover, different ways of using technologies in the production process. Therefore it is necessary to equip people with the knowledge required for taking part in public discourses about the direction which the use of technology should take (MacKenzie, Wajcman, 1985). Here it is important to note that there may be different answers from the same person, depending on his or her perspective as for example a consumer or worker (Rauner, Rasmussen, Corbett, 1988). Whilst this is important for adult education in general it has special consequences for continuing vocational education and training. As far as their work tasks are concerned workers should be empowered to co-determine the way technology is employed at their workplace (Brödner, 1990). That this is by no means an utopian aim is illustrated by the strong move in the computer industry towards "participatory software development" (Ehn, 1988). It has been shown that including the workers concerned in the development process leads to solutions which are more efficient from the point of view of the management too. Clearly the reason for this is that workers are more able and willing to utilise new technology if they have had the opportunity to influence its "shape". This is the technological aspect of the principle of "shaping one's own worklife". Learning in this way by itself not only renders people more self-reliant. Moreover, people realize that what they are learning enables them to really co-determine how they work. This in turn should give them the consciousness of becoming partly independent which should foster their willingness to participate in the public sphere.

A similar, even stronger, argument holds for the social area of work organisation. Obviously it is possible either to increase responsibility merely for the sake of higher productivity, by intensifying production pressure, or to foster it in the interest of the workers, too, enabling them to create working conditions which meet their own requirements. It seems possible to come to better compromises between management and workers here, also, because such improved working conditions in the end will also often increase productivity. This in fact constitutes the "philosophy" of the "learning organisation" if this idea is taken seriously.

5. Vocational Education and Training: Preparing for Shaping the Worklife

By employing the "shaping approach" in continuing vocational education and training major changes should result. In addition to programmes of further education on the one hand, and learning aimed at adaptation to altered work tasks on the other, teams aiming at improving work organisation, or "shaping circles", should be permanently established. This suggestion has proven not to be utopian, too. There is ample evidence (Kern, Schumann, 1986) that there is a move towards such measures aiming at such organisational forms, sometimes called "learning islands", although their full scope has not been explored. Shaping circles may lead to a closer connection between continuing training and human resources development, in contrast to approaches based merely on the improvement of recruitment. Additionally, the "shaping principle" should be applied to initial vocational education and training.

Here it is necessary to change school based learning as well as learning at the work place. The former has, in compliance with what at present is much discussed under the headline of core competencies and key qualifications, to concentrate on problem solving, creativity and communication skills. But above that, it is important to present students with the possibility of alternative solutions in order to further their ability to design solutions which may meet different interests. Only in this way they will realize that there are in fact alternative solutions, and it is a matter of the strength of different interests which one either has been chosen in the past or will be chosen in the future. Work based learning should be given more emphasis because it is suited for fostering experiential learning (Brown, Collins, Duguid, 1989). This is most important for gaining experience in complex real-life situations which require not only "know that" (Dreyfus, Dreyfus, 1986), i.e. symbolic knowledge, but also "know how" to deal with problems in reality, including human communication at the work place. The importance of this has been increasingly stressed recently (Griffey, Kelleher, 1996) with reference to "non-conscious learning" (Lewicki, Hill, Czyzewska, 1992), or "tacit knowledge", which can be analysed by means of a "dialectics of acting and imagining" (Heidegger, 1987). When it comes to the question of how to prepare people for lifelong learning it has been shown not to be enough just to explain its importance to students. Nor does it seem to be sufficient to "lay the ground" for further learning, during initial vocational education and training, by teaching "learning skills" - whatever they may be. Recent research into Artificial Intelligence has begun to stress the significance of motivation for learning, that is for attaining intelligent behaviour (Pintrich 1989). Motivation however is based in the emotional domain of human life, so emphasizing the relevance of this realm even to, as it seems, purely cognitive tasks. This relation can be analysed by a "dialectics of work and love", connected to the relation of cognition and emotion (Heidegger, 1987). In this way, the horizon of occupational training at least partly encompassing learning for "general" development of one's personality is opening up.

6. Concluding Remarks

The trend towards learning being used only instrumentally for higher economic competitiveness represents an all too narrow view. The learning of adults, even if primarily aiming at improving the performance of work tasks, may be changed so as to support individual independence at the work place and by that fostering educated citizenship and holistic self-fulfilment. The "shaping approach" presented here has been employed in several model schemes in Germany but is, under different headings, also being discussed in international literature on vocational education and training as well as in human resource development, although mostly with less far reaching claims. The possibilities of strengthening this approach, also in initial training, seem of great promise.

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Evaluation of the Professional Teachers - The Requirements for a Nurse Teacher

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Abstract

The purpose of this study is to survey evaluation of the professional teachers by investigating the requirements set upon the nurse teachers as an example. Based on the results of this study an evaluation basis and tool for the evaluation of the work and education of nurse teachers will be created.

In the existing nursing and vocational education literature, there are different expressions and classifications for the requirements for ideal teachers. In this study the classification is further developed. The content areas of the requirements for nurse teachers are: 1) nursing competence, 2) teaching skills, 3) evaluation skills, 4) personal characteristics and 5) relationship with students. Based on these categories, a written evaluative instrument, IDEAL NURSE TEACHER (INT)-tool has been created. The tool consists of 75 Likert-type items.

The data collection will take place by using the INT-tool in Finland, Norway, United Kingdom and Germany. In each country the data is collected from nurse teachers (N=about 80) and from nurse students (N=about 150 graduating students). The data will be analysed statistically. The very first results show that there are quite many differences by the point of view of nurse students in Finland and Norway.

After this study the evaluation basis and tool for the evaluation of the work and education of nurse teachers will be created. The created evaluation tool can also be applied to vocational education.

Introduction

Nowadays we must consider the quality of teaching in nursing. Students expect effective teaching, administrators are interested in the outcome of teaching. Teachers themselves are of the most effective approach when teaching nursing skills.

The purpose of this study is to survey evaluation of the professional teachers by investigating the requirements set upon the nurse teachers as an example. The aims of this study are 1) to determinate the requirements for the ideal nurse teacher, 2) to create an evaluation tool based on the requirements and 3) to compare the requirements internationally. Based on the results of this study an evaluation basis and tool for the evaluation of the work and education of nurse teachers will be created. This study is carried out as a project led by associate professor Helena Leino-Kilpi at the University of Turku, the Department of Nursing.

Theoretical Frame of Reference

In the existing nursing and vocational education literature, there are numerous descriptions of the requirements of the ideal teacher and his/her characteristics (e.g Jacobson 1966, Kiker 1973, Rauen 1974, O'Shea & Parsons 1979, Brown 1981, Mogan & Knox 1985, 1987, Nehring 1990, Vähätalo 1990, Leino-Kilpi 1992, Leino-Kilpi & al 1994, Reeve 1994). The requirements do change with time and of course across different cultures, but there is nonetheless a basic set of criteria that seems to remain more or less constant. Vähätalo (1990) observes, on the basis of his comprehensive review, that the characteristics of the ideal teacher are typically described in terms of personality traits rather than by reference to actual teaching process.

In this study, the theoretical frame of reference is based on the classification of the ideal nurse teacher, originally presented by Jacobson (1966). This classification is developed and used later internationally also in Finland. In this study the classification is further developed. The content areas of the requirements for ideal nurse teachers are: 1) nursing competence, 2) teaching skills, 3) evaluation skills, 4) personal characteristics and 5) relationship with students. Based on these categories, a written evaluative instrument, IDEAL NURSE TEACHER (INT)-tool has been created. The tool consists of 75 Likert-type items.

Nursing competence refers both to theoretical and clinical knowledge and skills and to attitude toward nursing practice. Jacobson (1966) makes a distinction between three dimensions: supervision to professional responsibility, keeping ones knowledge and skills up-to-date, and implementation of high-quality professional nursing. Kiker (1974) proposed a classification where the characteristics of the ideal nurse teacher were professional competence, relationships with students and personality traits. Rauen (1974) defined the teachers' role as social, nursing and teaching roles. The results of the study of Mogan and Knox (1987) and also Nehring (1990) showed that the good nurse teacher is a good role model, enjoys working in nursing practice and teaching, she/he has good clinical skills and takes responsibility for what she/he does. By the opinion of the teachers themselves, administrators in nursing education and clinical supervisors the most important requirement for a good nurse teacher is to teach the students how to integrate theoretical knowledge and nursing practice. From the students' view it is most important that teacher takes responsibility for her/his own actions. (Leino-Kilpi & al 1995.)

In the 1990s Leino-Kilpi (1992) carried out a national survey in Finland to explore the views of nursing students (n=379) on what makes a good nurse teacher. The students were asked to identify at least three characteristics of the ideal nurse teacher. Based on the results 75 %of students regarded nursing competence as an important factor. Teaching skills were mentioned by 68 % as an important factor and relationships with students were mentioned by 43% of respondents.

Teaching skills have been widely studied both in the field of nursing and education. Analysis of the results is not easy given because of the differences in educational systems. It is noteworthy that studies concerned with teaching skills rarely step outside the educational system; the boarder role of education in society and health policy is hardly identifiable. Some studies argue that nurse teachers should look upon their job of teaching nursing precisely as part of social and health care policy. Gallego & Walter (1991) point out of that nursing students are trained to work in changing nursing and social circumstances. This means that teachers must also be able to cope with changes in society. Leino-Kilpi & al (1995) found that the administrators in nursing education and teachers themselves appreciate encouragement of the students to critical thinking and guiding to continuous acquirement of knowledge. The teacher should be some kind of tutor not only a knowledge deliverer. There are certainly some problems how to realize ideal teaching skills. The students are the most critical in this respect. The teachers themselves have the most positive assessment of themselves. (Leino-Kilpi & al 1995.)

Evaluation skills comprise not only the evaluation of student performance but also assessment of the teacher's competence. Teachers believe that with positive feedback they can stimulate, encourage and raise the students self-confidence (Leino-Kilpi & al 1995). Systematic and comprehensive evaluation of the teacher's work is rare, even though self evaluation is identified as the most important method of evaluating and developing the teacher's job (Brookfield 1990, Ward-Criffin & Brown 1992).

Personality factors comprise individual attitudes as well as personality traits which are not directly related to teaching, nursing or personal relationships but which can have an impact on all of these.The students think that a good nurse teacher admits her/his own mistakes, is flexible and realizes that student has something else than studies in her/his life too (Leino-Kilpi & al 1995).

Relationships with students has been the subject of intensive research. The students are in a key position to provide information about student-teacher relationship. Studies on the teacher-student relationships indicate this relationship is an equal and open in which both parties act independently and in close collaboration. The result of the study of Leino-Kilpi & al (1995) point out that encouragement and respect seemed to be the most important requirements for a nurse teacher.

Data Collection and Analysis

The data collection will take place by using the INT-tool in Finland, Germany, Norway and United Kingdom. In each country the data is collected from nurse teachers (N=about 80-100) and from nurse students (N=about 150 graduating students) The data collecting has begun in November 1996 and it will end in may 1997. The data will be analysed statistically.

Results and Conclusions

Reporting of this study will be national and international and the results will be reported in collaboration with above mentioned countries. The very first results show that there are quite many differences by the point of view of nurse students in Finland, United Kingdom and Norway. After this study the evaluation basis and tool for the evaluation of the work and education of nurse teachers will be created and used in the evaluation of nurse teachers in collaborating countries. The created evaluation tool can also be applied to vocational education. According to the teachers' views it is difficult to be ideal teacher today: there are too many requirements and only a few opportunities to develop oneself.

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Quality Process of Adult Vocational Training

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Training Is a Process of Production, Maintenance and Development of Competences

If we consider training as a process, it becomes necessary to analyse and to take into account each of the stages in this process, from identification of the needs right through to assessment of the effects on the organisation.

This process is composed of four stages, which are presented hereunder.

1st stage : Identification of the competences required on the basis of the objectives of the company

2nd phase : Definition of training responses, formalisation of training courses, drawing up of contracts

The written specification of the training course is the fundamental and necessary tool which makes it possible for the supply to meet the demand.

3rd phase : Pedagogical expertise, the design and execution of the course, assessment of the course and of the competences acquired

The pedagogical file constitutes the reference document of the trainer who is to be responsible for carrying out and managing the course which is to be under his responsibility.

4th phase : The application of competences, assessment of information transfer and the effects of the training on the organisation

Quality Process of Adult Vocational Training

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If we consider training as a process, it becomes necessary to analyse and to take into account each of the stages in this process, from identification of the needs right through to assessment of the effects on the organisation.

This process is composed of four stages :

1st stage : Identification of the competences required on the basis of the objectives of the company

This is done on the basis of the analysis of the activities and the corresponding competences which are required, bearing in mind the orientations of the company in terms of strategy and management of human resources.

A general method of questioning and analysis is indispensable, if the client company is to be enabled to identify the competences which are to be produced, maintained or developed, to analyse the corresponding needs and to examine to see if training is the only or one of several possible solutions (other avenues may be explored, such as work organisation, recruitment, communication, management ...).

The creation or the use of existing analytical tools, such as activity or competence file, can provide an efficient contribution to the identification of competence needs and the corresponding methodological or relational know-how.

☞ **See :**
Annex 1 "Activity, competences and training files"

2nd phase : Definition of training responses, formalisation of training courses, drawing up of contracts

If the acquisition of the target competences is to be through training, then a precise, written formulation of these competences, or training objectives, provides the guarantee that the client company has formulated a precise demand for the supplier or the suppliers who have been contacted, so as to obtain an adapted response which will satisfy them.

Indeed, the value of a training course depends, first and foremost, on the supply corresponding to the demand, which is obtained on the basis

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of good formalised and negotiated communication between the parties concerned. In the light of this, one of the first priorities will be to come to an early agreement between the parties as to the criteria for assessing the success of the course.

The written specification of the training course is the fundamental and necessary tool which makes it possible for the supply to meet the demand.

☞ **See :**
Annex 2 "Written specifications of the training course"

3rd phase : Pedagogical expertise, the design and execution of the course, assessment of the course and of the competences acquired

Before carrying out any course, it is necessary to develop it through the drawing up of a **pedagogical file under the responsibility of the training centre.** This document, which specifies the **pedagogical objectives** and constitutes the commitment that the specifications will be respected during the training course itself, both when the training centre is alone in carrying out the course and when internal or external parties are involved.

The pedagogical file constitutes the reference document of the trainer who is to be responsible for carrying out and managing the course which is to be under his responsibility.

Assessment is, in itself, a constant parameter for the evaluation of quality. In terms of training quality, the assessment must mainly cover the course itself and the competences acquired through the training. This is the responsibility of the trainer although the hierarchy may also be involved.

Such an assessment, which is essential, can be completed by measurement of the degree of satisfaction of the trainees, both by the trainers and the hierarchy. Such an indication can also contribute to the quality of the course.

The competence of the trainers is also decisive in terms of the quality of the course. That is why the selection and the preparation of the trainers demand particular care.

☞ **See :**
Annex 3 "The pedagogical file"
Annex 4 " Assessment of courses and their results"
Annex 5 " Trainer competences"

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4th phase : The application of competences, assessment of information transfer and the effects of the training on the working environment

It is the role of the client company to enable the application of the acquired competences in work situations. This application provides the opportunity to assess the competences transfer and its effects. It is the sole source of feedback as to the efficiency and the relevance of training courses through real experience and in the light of the competence deficits and problems which were identified at the start. It can result in the complete or partial modification of the training process, so as to improve its global quality or may even bring this choice into question. This is the last essential stage in the application of quality insurance for a training course.

☞ **See :**
Annex 3 "The pedagogical file"
Annex 4 " Assessment of courses and their results"

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Annex 1

Activities, competences and training files

THE THREE FILES

In chronological order, we can identify the three following files :

- **the activity file :** it describes the activities, tasks, current and perhaps future operations linked to the performance of a function. This description is drawn up in the light of the missions and objectives of the company, the contributions hereto of the different functions as well as the environment.

- **the competence file :** it is based on the aforementioned file and describes the competences required to carry out the identified activities. There may be gaps between the competences required for the function and the competences of those doing it. Training is one of the means which may be selected to eliminate this gap.

These two reference files enable us to identify the objectives of training

- **the training file :** this lists and defines the competences (knowledge, know-how...) to be acquired in any measure to increase professionalisation.

This file provides both the basis and the details for the specifications of the training course (when it is a process) as well as for the corresponding pedagogical file (see Annex 2 and 3 under the sub-heading "General pedagogical objectives")

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Annex 2

The written specifications of the training course

The competence needs have been correctly identified by the client company and the solution of training has been decided on as being relevant and has been selected for the total or partial satisfaction of those needs.

- The client company selects standard training courses ("catalogue"). This choice requires the negotiated acceptance by the parties of the elements defining the course requested. These are contained in a predetermined written specification prepared by the training centre.

The headings and content of these specifications may include the following points :

- Course title, code
- Expectations in terms of contribution of the course
- Coherence of the course with other measures (training or others)
- Trainees concerned
- Required knowledge
- Position in the curriculum
- Training objectives
- Pedagogical objectives (general)
- Conditions of competence transfer and of success
- Organisation and running of the course
- Methods of qualitative follow-up and assessment
- Means of validation of acquired knowledge
- Training content
- Financial and material terms
- Methods for the modification of the specifications

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Annex 3

The pedagogical file

The pedagogical file is the responsibility of the training centre.

This file is a document which lists the content of the main components of the training course in detail. It is drawn up on the basis of the specifications by the training centre. It fulfils several roles which all contribute to the quality of the course :

- It is the basic reference document for the pedagogical work of the trainer (preparation of the course),
- It guarantees the global coherence of the course,
- it helps in capitalising on the course
- it guarantees a homogenous approach if there are to be several trainers carrying out the same course.

The headings and the content of the pedagogical file can be as follows :

- Training objectives (reminder)
- General pedagogical objectives
- Specific pedagogical objectives
- Pedagogical progression
- Pedagogical instructions
- Means of assessment
- Documents
- Methods for up-dating the pedagogical file

Care must be taken so that **there is only one pedagogical file for a given course**. However, each trainer may then draw up his own "training guide". This will allow him to adapt his training, on the one hand to his personal training style and on the other to the specific needs of the trainees with whom he is in direct contact. The training guide is the personal property of each trainer.

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Annex 4

The assessment of courses and their results

To assess is to make a valued judgement on the object in question with the aim of making a decision. As far as training is concerned, the "object in question" is the course and its results. The evaluation by the trainees is the responsibility of their hierarchy.

In certain circumstances, however, the trainers must evaluate the trainees in terms of their behaviour in identical situations to the professional situation. This is the case for those courses leading to qualifications. In this annex, however, we will only deal with the evaluation of courses and their results. **This evaluation may cover three points : pedagogy, skills transfer, the effects of the course on the working environment. However any** evaluation requires that a certain number of the questions below be asked:

1. QUESTIONS TO BE ASKED BEFORE EVALUATION

Why assess ?
For whom ?
When ?
With whom ?
What ?
How ?
Where ?
To take what decision ?

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Annex 5

Trainer competences

The role, and therefore the selection of the trainer - be they permanent or occasional - are decisive in the quality of the execution of the training course, as is their training.

The process described in Annex 1 thus perfectly applies to the activities required of the trainer, and is the very basis of the selection of the trainer (internal or external) and his professionalisation.

◆ **Basic abilities and competences to be considered in the selection of an occasional or permanent trainer :**

- → mastery of the knowledge and know-how for the relevant technical content,
- → ease and correctness of spoken and written language,
- → listening, dialogue and communication qualities.

◆ **Pedagogical knowledge and know-how common to all trainers :**

- → competences in **setting up the course**
- → competences in **carrying out the course**
- → competences in **assessing the course**

◆ **Abilities and competences common to several activities or professions but useful to the activities of occasional or permanent trainers :**

The most important are :

- → chairing a working meeting,
- → observing situations, analysing methods,
- → analysing documents, producing a synthesis... of a meeting, file, interview - developing a critical mind
- → drawing up documents,
- → leading an interview,
- → collecting and transmitting information on the work environment - being informed and welcoming...
- → adapting to different sorts of people, to change, to the unexpected,
- → being organised (space and time) - organising - pinpointing - bringing together - coordinating,
- → etc.

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Research Development and the Challenges of the 21st Century for Vocational Education and Training

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Synopsis

The gap between research development and multiplication such as diversity of vocational education and training experiences could be harmful to the quality of such experiences. This is why we analyze the role of research as a mean for meeting the challenge of the 21st Century's requirements in vocational education. The quality and flexibility requirements in workforce qualifications emphasize the role of research regarding roles and interactions of actors involved, outcomes for the students, assessment of on site teaching methods set-up and the aspects of education and training. We insist upon the characteristics of this research to improve its effects on practices, such as: increasing recourse to multidisciplinarity, developing a cooperative approach with practitioners in school and enterprise and intensifying collaboration and international comparisons to enrich each country's research. We conclude by a brief outlook on development, in Canada, of Strategic research networks in education and training.

Purpose and Significance

Despite important progress realized during the last decade, recognition assigned to vocational and technical education and training research is much weaker than that allowed to academic education research and to other educational aspects. In many national or international scientific conferences on education, we note very few presentations on vocational and technical education and training, more, these are scheduled at a period of lower attendance such as the last day or mid-day of the conference. Some scientific education Journal[1] just start publishing articles on vocational and technical education and training. Space allowed is often restricted whereas others refuse such type of article without having it evaluated because they consider it too specialized for their readers.

In other respects, politicians, decision-makers and analysts of socio-economic and educative questions recognize the strategic importance of developing and reforming vocational and technical education and training for the future of youth and workers and also for the economic development of societies (Marshall & Tucker, 1992). Vocational and technical education and training experiments must therefore be quickly increased and varied. Despite increasing research in vocational and technical education and training, it cannot ameliorate practices easily because divergence persists and even increases with the creating of knowledge and the needs of innovating development in vocational and technical education and training. This is followed by a lack of assessment in experiments results with regard to pursued objectives, a misknowledge of resistances and eventual perverse effects of some experiments and also a risk to repeat costly mistakes. This is the reason for analyzing the research development role as a mean to meet the challenges of vocational and technical education and training for the 21st century.

Conceptual Framework

Vocational and technical education and training must henceforth comply with high quality and flexible requirements to satisfy the labour market expectations by developing intellectual dispositions, personal and social skills as well as technical skills. As has been said by Deborah Meier, during an interview "We need to do a lot better job of teaching students to meet deadlines, ask good questions, take initiative and set high standards for themselves - to take on a sense of responsibility for the work they are engaged in. If we do this we'll go a long way toward answering employers' complaints" (Dykman, 1997, p.32.).

Facing the actual and future development of qualification needs of workforce, the research role is varied as it must scrutinize different aspects such as: consider the outcomes of education and training for students, show interest to teachers involved in important changes in their practices of teaching, keep in mind employers' expectations (Finch, 1993). Research is also required for the study of different processes for teaching occupational specific skills such as: workplace mentoring or youth apprenticeship, cooperative education or alternance training and different types of work-based learning or school-based enterprises.

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[1] We did not consider rare national or international scientific journal dealing exclusively of vocational and technical education and training.

Stasz's literature review (1996) shows the importance of considering different conceptual approaches in the study of developing new skills in school and in the workplace. It is essential to add to economic studies especially aimed towards employers, cognitive, sociological and ethnographic approach considering the learner and teacher, studying means of teaching thinking and problem solving and developing a sense of responsibility and organization, etc. Other researches are also essential on curriculum, pedagogy and strategies to overcome the resistance and disinterest of a large number of students to pursue their education and training after compulsory schooling (Raizen, 1994).

Critical research approach contributes largely to the analysis of aspects forgotten by schooling, governmental or employer organizations. We wish as Lakes and Bettis (1995), that critic researchers recognize the links between economic situation and daily experiences of students, workers, teachers, supervisors and mentors, etc. They could consider the students' subjectivity and consequences of their education and training in developing their professional and social identity. They can also analyze the cultural resistance of students towards proposed knowledge as well as modes of socialization conveyed by the teaching of knowledge (Tanguy, 1991).

Methods and Procedures

Methodology's recognition of the role and importance of research relies on the progress and diversification of research in vocational and technical education and training also on a closer cooperation between researchers and practitioners in school and enterprise to improve practices.

Many researchers argue the fact that research progress is difficult to get on by rarefied research grant awards. The justification is partially fair but ignores researchers' role to sensitize practitioners, analysts and public authorities to the favourable effects of research on the improvement of practices. Too few researchers persevere in vocational and technical education and training. In spite of budget cuts, we are positive that an increase of high quality research proposals is an important factor to add credits. Incidentally, many countries are affected by the lack of researchers involved, for a lengthy period, in vocational and technical education and training.

Research must not only be more numerous and more diversified. It is desirable that researchers come from different conceptual approach so that vocational education and training can benefit of methodologies and knowledge in study fields liable to help its development such as: psychology, sociology, ethnography, pedagogy, communications, learning technologies, economy, industrial relations, school management, industrial management, etc. Representatives of these different conceptual approach must work together in a multidisciplinary and complementary perspective considering problems encountered in vocational education and training.

In order to increase its efficiency, this research has to be enrolled in a collaborative approach by developing research partnerships with education and workplace practitioners. These partnerships help practitioners to ask the useful research questions and sensitize them with the research role to improve their practices.

The few research resources and similarities between countries, conferred by the world-wide economy, urge to improve collaboration and international comparisons. Development of these is stimulated by the works of the European Economic Community (Jobert, Marry & Tanguy, 1995), the multiplication of international exchanges (Hardy & Maroy, 1995) and the production of the International Journal of Vocational Education and Training by IVETA (Finlay & Niven, 1996; Lasonen & Nevin R. Frantz, 1996).

Conclusion

Further to a Grant of Social Sciences and Humanities Research Council of Canada, we are leaders of a Research Network regrouping nine researchers of five universities specialized in seven disciplinary approaches. This network is formed of five research teams supported by 35 partnerships among: vocational education high schools, colleges, enterprises, unions, governmental organisms in education and employment, social and economic groups implicated in training and employment relationship. This network is active with five international collaborators and benefits of other international exchanges. The Council has also selected four other Research Networks.

The collaboration between partners and researchers of these five teams is being articulated progressively. This emergence work is interesting because others School boards and colleges apply for their integration as partners in our network. Government organisms wish to receive our research results as soon as possible. We are working on the organization of efficient collaboration with the four other Research Networks to increase the diffusion of research results between researchers and to practitioners. We want to add a substantial support to improve vocational and technical education and training to help the last century's needs. Till then, we must harmonize our conceptual approaches so as to develop the most appropriate knowledge to improve practices while developing efficient collaborations with the practitioners at each important steps of the research works. The realisations of those dialogues will begin in each research projects and carry on in development of the Project Committee for each research team and also in the Network Advisory Board. These collaborations apply to the choice of study programs and training strategies to be analyzed, to discussions of preliminary results up to the forecast of research results according to methods which contribute to improve the education and training of practitioners and their practices.

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Teachers' Contributions to and Involvement in School-to-Work Transition

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Abstract

The current school-to-work transition movement in the United States has placed new demands on educators to provide school-based and work-based learning and organizing linkages between the school and the workplace. Unfortunately, little is known about the expertise teachers must have to function successfully in this new educational context. This research focused on identifying and delineating teachers' involvement in and contributions to school-to-work transition. The study builds on recent conceptions of professional development in an era of educational reform and is grounded in a professional development framework that includes four phases: needs, focus, delivery, and impact. Information was gathered via community profile studies. A total of 199 educators, workplace representatives, and community members were interviewed at 11 communities, each in a different state. Analysis centered on identifying meaningful themes associated with teachers' school-to-work involvement and contributions. Teacher contributions to school-to-work success could be organized into 10 different themes that focused on a wide range school-based, work-based, and linking activities. Twelve themes were identified that reflect characteristics teachers should have to conduct successful school-to-work programs. A matrix was created that reflects how teacher contributions and characteristics interface to better identify teachers' needs. Implications for change to professional development programs are also provided.

Purpose and Significance

With the current emphasis on school-to-work transition in the United States, schools must become places that accept responsibility for integrating work-related knowledge into the curriculum along with methods, materials, and strategies that support this knowledge. Further, employers need to interface with school personnel to help them meet the challenge of this responsibility. Some vocational educators have and continue to interface with employers through various means including advisory committee activities, placement of cooperative students, school-based enterprise projects, career academies, actual work experience, and business and industry tours and observations. With the current tech prep and curriculum integration movements, some academic teachers and guidance counsellors have also had the opportunity to interact with employers in various ways. Most teachers, however, do not perceive students' transition from school to work as an integral part of their teaching and give little or no effort to interfacing with employers. Kazis and Barton (1993, p.21) indicate that the linking of school to work will require extensive teacher professional development to provide teachers with the knowledge needed to build programs with work-related experiences as well as new methods of assessment that will help students transition to work.

Thus, most teachers' current experiences are school-based and have not included ways that meaningful linkages can be created so students may be assisted as they transition to work. Deep-rooted tradition has led to school personnel viewing school-based learning as separate from work-based learning. The challenge, then, is to provide all teachers with opportunities to gain occupational-related knowledge, instructional expertise, and associated attitudes needed to interface effectively with employers (Pauley, 1994). To meet the school-to-work goal of moving from isolated programs to a system that helps large numbers of students successfully transition to work, all school personnel must support the effort. As Stern, Finkelstein, Stone, Latting, and Dornsife (1994) note, "Within schools, major decisions must be made about the curriculum of school-to-work programs." They continue, "Building integrated school-to-work programs for large numbers of students will require the active collaboration of non-vocational teachers and departments" (p. 143).

The current study may be viewed as foundational since it focused on what teachers need to conduct successful school-to-work transition efforts. Therefore, the purpose of this study was to identify and delineate teachers' involvement in and contributions to the success of school-to-work transition. More specifically, we sought answers to the following questions: (a) What teacher activities contribute to school-to-work success? (b) What characteristics must teachers have to conduct successful school-to-work programs? Answers serve as the basis for structuring professional development that teachers need to help students transition to work.

Conceptual Framework

This study builds on the rich heritage of professional development, but more specifically on recent conceptions of professional development in an era of educational reform. Professional development (sometimes termed personnel development, staff development, and in-service education) has traditionally been the responsibility of colleges and universities. These institutions have tended to focus a great deal on preservice teacher education and somewhat less on in-service education. However, numerous changes in the ways public schools operate as well as what is taught and how it is taught have had a profound effect on educators and the ways they develop on the job (Little, 1993). For example, the implementation of Tech Prep, academic and vocational education integration, school-to-work transition, and other educational reforms have shown that teachers must be prepared to work at diverse tasks including functioning as members of interdisciplinary and school/community/workplace teams and engaging in collaborative curriculum development and teaching (Finch, Schmidt, & Faulkner, 1992).

In recent years, several frameworks for professional development have emerged that appear to encompass the evolution of and revolution in teachers' professional roles. Taking a rather generic view, Finch (1989) noted that professional development was evolving into a more comprehensive set of phases that include: needs, focus, delivery, and impact. Needs are "derived from the contexts within which professional development will take place and the types of potential professional development recipients" (p. 6). Professional development focus is driven by needs and context as well as content to be delivered and potential benefit to recipients. How professional development is delivered thus becomes a function of needs, focus, context, potential delivery modes, and potential delivery settings. And finally, assessing professional development's impact is a function of context, needs, focus, and delivery. More recently, Finch, et. al (1992, p. 5) presented a vision of an evolving professional development paradigm. Within this paradigm, consideration is given to teachers' new professional roles in the schools as well as how professional development needs that are generated by these new roles should be met. Professional development assumes a new character that includes greater emphasis on: school-based development, teachers teaching teachers, collective or team development, continuous professional development activities, informal opportunities for professional development, and teacher self-governance and decision-making in meeting professional development needs. Support for this paradigm, upon which this study was based, may be found in several sources including Schmidt, Finch, and Faulkner's (1992) study of teachers' roles in the integration of vocational and academic education, Little's (1993) comprehensive essay on professional development in a climate of educational reform, Sparks' (1994) discussion that documents reasons for a paradigm shift in staff development, and Bull and Buechler's (1995, March) in-depth study of professional development in Indiana. As we conducted this research, we thus gave consideration to teachers' needs and the contexts within which these needs were generated.

Methods and Procedures

Information about teacher involvement in and contributions to the facilitation of school-to-work transition was gathered via community profile studies. The communities participating in the study were selected based on several criteria including (a) the extent and effectiveness of school-to-work linkages and other involvement between schools and employers, (b) the extent to which school- and work-based programs were fully operational and graduating students from these programs, and (c) documentation of long-term commitment that schools, employers, and the community have made to school-to-work transition. Nominations for sites selected were sought through mailed surveys to state school-to-work coordinators from across the US. In addition, key individuals were telephoned in several states based on information about on-going school-to-work activities identified through the literature in these states. The complete study spanned a two-year time frame with information collected at 11 sites. At each of the sites, information was gathered through interviews with teachers, administrators, counsellors, employers, and community representatives. These were individuals involved in school-based learning, work-based learning, and activities linking school-based and work-based learning. The primary information collection approach was the long interview, with a total of 199 interviews conducted at the eleven sites. Included in the interview protocol were questions and probes designed to assist interviewees in identifying and describing best school-to-work practices teachers had used at each site, including those where they interfaced effectively with employers. The critical-incident technique was used in the protocol to help interviewees focus on describing examples of teachers' best practices.

Following Lofland's (1971) and Miles and Huberman's (1984) recommendations, analysis and interviewing were conducted concurrently. The analysis centered on identifying meaningful themes associated with teachers' school-to-work involvement and contributions imbedded in the interview text and on determining to what extent common elements existed across sites. To handle the extensive text transcribed from the interviews, The Ethnograph software was used. This software allowed for coding, grouping, coding again, and regrouping information according to various themes.

Findings

For the first question, which addressed teacher activities that contribute to school-to-work success, ten themes emerged. The themes were (a) involving students in organized workplace experiences, (b) helping students to understand the workplace, (c) involving workplace representatives in school activities, (d) providing workplace experiences for students through school activities, (e) including a workplace focus in school instruction, (f) learning about the workplace to contribute to better teaching, (g) working in the workplace, (h) initiating and maintaining contact with employers, (i) designing classroom experiences around workplace expectations, and (j) following up on current and former students. Discussion for each theme is based on comments provided by the interviewees and is supported by actual statements they provided. For example, the first theme focused on business and industry experiences that teachers, both individually and as members of teams, planned and arranged for their students. These experiences were of an active, hands-on nature. Students were engaged in a wide variety of on-the-job experiences including mentoring, shadowing, interning, cooperative work experience, and youth apprenticeships. A retail manager in discussing the importance of on-the-job experiences for students noted that these first job experiences his business offers for the students "brings them out of their shells and they learn how to communicate with customers."

For the second question, which addressed characteristics that teachers must have to conduct successful school-to-work programs, twelve themes were identified. The themes were (a) understand and meet students' needs, (b) establish and maintain relationships with the workplace, (c) know the workplace, (d) communicate effectively about school to work, (e) be adaptable and open to change, (f) demonstrate positive attitudes toward work, (g) be professional in appearance and conduct, (h) apply school learning to the workplace, (i) know schools and schooling, (j) be knowledgeable and competent in teaching area, (k) be creative and innovative in teaching, and (l) be committed to teaching. Comments the interviewees provided served as the basis for the discussion of each theme. For example, the second theme focused on the need for teachers to establish and maintain positive relationships with members of the workplace. These relationships included communicating with businesses, accepting the importance of business to today's students, getting involved with individuals in the workplace, knowing how to interact with these people, and establishing a presence in the business community. As an administrator noted, "teachers have to keep connections with the workplace, they can't just talk about what the workplace is like, . . .they must have connections, linkages, and they have to keep current."

Conclusions, Implications, and Recommendations

To draw conclusions from the findings, a matrix was developed for the themes that emerged for the two questions. We interfaced themes from the second question regarding characteristics teachers must have to help students transition to work with each of the ten activities (themes) for the first question. As an example, the first activity (theme) was involving students in organized workplace experiences. We identified seven characteristics, second question themes, that teachers need to conduct these activities. Conclusions then focus on knowledge, attitudes, and competence teachers need to conduct the activities successfully. For example, the school-to-work activity (theme) of involving students in organized workplace experiences requires that teachers understand needs their students have (a teacher characteristic) and align these needs with workplace expectations. Understanding students' needs is, thus, a prerequisite to meeting them. These needs may include students' strengths, limitations, interests, and potential for growth. Knowledge about each of these is important when teachers make decisions about students' work-based placements.

Implications and recommendations focus on how all teachers can be better prepared to help their students transition to work. They include:

- Having teachers examine the findings of this study and assess how their own knowledge, attitudes, and competence compare with those needed for school-to-work activities the interviewees described and characteristics they identified as essential for teachers.
- Providing professional development experiences for both practising and prospective teachers that give them opportunities to learn about the various school-to-work activities implemented at the eleven exemplary school sites included in this study.
- Providing professional development that will help teachers acquire the characteristics identified as essential for conducting successful school-to-work activities.

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The Core Curriculum of Mechatronics for Industrial Vocational Teacher Education in Taiwan

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Abstract

The purpose of this study was to establish the frame of core curriculum of mechatronics for industrial vocational teacher education. The research method employed Delphi Technique to identify the contents of mechatronics curriculum. The subjects were sampled from "Inventory of Science & Technology Research Institute in R.O.C.", which was published by National Science Council. The questionnaires were mailed forth and back three times to gather data from 24 subjects. The data were analyzed by using Kolmogorov-Smirnov one-sample goodness of fit test. The conclusions were as follows:

1. The mechatronics curriculum integrate the fields of mechanical engineering, electrical & electronic engineering, control engineering, and information engineering.
2. The essential courses for mechatronics in the fields of mechanical engineering, electrical & electronic engineering, control engineering, and information engineering were identified in the study.
3. The 269 competencies for mechatronics curriculum identified in the study should be used to cultivate excellent teachers in this field.

Introduction

The term, "mechatronics", was firstly proposed in the 9th I.S.I.R. (Institute of Standards and Industrial Research) meeting, in Tokyo, Japan in 1979 (Konstanrinov, 1987; Doery et al., 1989); then the frame of subjects of mechatronics was constructed by Yamazaki et al. in Toyohashi University of Technology in 1985 (Yamazaki & Miyazawa, 1985). According to Yamazaki et al.'s frame work, most of the vocational senior high schools in Japan established their mechatronics curriculum. And in 1989, Taiwan also followed. In addition, owing to the labor shortage, many changes have occurred in the labor & employer relations, and the cost of employees increase gradually; then the Executive Yuan (1989) performed the plan about " A long-term plan of the manufacturing automation in R.O.C." from 1991 to 2000 in Taiwan. The key point about automation technology in that plan is "mechatronics". High technology and related industries developed rapidly in the late 1980s and into the present decade. With the approaching of the 21st century, a century of technology compact and labor compact, the manufactures have to practice mechatronics to complement the manufacturing automation effectively. And the basic way is the formation of base education of mechatronics. Therefore, the vocational industrial high school education, which supplies the basic-level technical manpower, plays a great role.

The Mechatronics Department was first built in Vocational Industrial Senior High School, National Changhua University of Education in 1989 to cultivate the basic automation manpower with the concept of mechatronics. This is the beginning of mechatronics vocational education in Taiwan. Unfortunately, there are no Mechatronics Departments to cultivate mechatronics teachers in the universities in Taiwan. Vocational industrial high school teachers in Mechatronics Department, in fact, is from the related departments, including Mechanical Department, Electronic Department, Control Department, Information Department, and so on. Therefore, it is necessary to explore core curriculum of mechatronics for industrial vocational teacher education.

Method

The purpose of this study was to establish the frame of core curriculum of mechatronics for industrial vocational teacher education. The research method employed Delphi Technique to identify the contents of mechatronics curriculum. The panel discussion was conducted before the implementation of Delphi Technique. The purpose of panel discussion was to convey the study's procedure to the experts and let them understand what the meaning of Delphi Technique was. The responses in questionnaire of Delphi Technique were recorded on seven-point, Likert-style scales which were from "agree completely" to "don't agree completely" in each item and were separately weighted by 7,6,5,4,3,2,1.

The subjects were sampled from "Inventory of Science & Technology Research Institute in R.O.C." which was published by National Science Council. There were 24 subjects whose background and expertise are shown in Table 1 and Table 2. The questionnaires were mailed forth and back three times to gather data from these subjects. The data were analyzed by using Kolmogorov-Smirnov one-sample goodness of fit test, mean, and standard deviation.

Table 1. *Position Analysis of Delphi Subjects*

Position	**Numbers of Subjects**
Professor	12
Division head	4
Department head	4
Industry representative	4
Total	**24**

Table 2. *Professional Background of Delphi Subjects*

Profession	**Numbers of Subjects**
Electrical & Electronics	8
Mechanics	7
Control	5
Industrial Technology	1
Aerospace Engineering	1
Administration Management	1
Total	**24**

Results

The results from data analysis were as follows:

1. As shown in Table 3, the mechatronics curriculum integrate the fields of mechanical engineering, electrical & electronic engineering, control engineering, and information engineering. These four fields are almost like the contents of mechatronics proposed by Yamazaki et al. in 1985, which include the fields of mechanical design engineering, electrical & electronic engineering, control engineering, and computer science.

Table 3. *The Fields of Mechatronics Curriculum*

Field **Item**	**K-W test Z-value**	**Mean**	**Standard Deviation**	**Degree of Importance**
Mechanical Engineering	3.12*	6.79	.66	7
Electrical & Electronic Engineering	2.92*	6.75	.68	7
Control Engineering	2.10*	6.46	1.02	6
Information Engineering	1.99*	6.00	1.18	6

*$p < .05$

2. As shown in Table 4, the essential curriculum for mechatronics in the field of mechanical engineering includes: (1) mechanism, (2) pneumatics & hydraulics control, (3) robotics, (4) statics, (5) dynamics, (6) mechanical design, (7) computer integration manufacturing, (8) mechatronics practice, (9) numerical control, and (10) mechanical drawing.

***Table 4.** The Essential Curriculum for Mechatronics in the Field of Mechanical Engineering*

Field Item	K-W test Z-value	Mean	Standard Deviation	Degree of Importance
Mechanical Engineering				
Mechanism control	2.10*	6.21	1.50	6
Pneumatics & Hydraulics	1.79*	5.96	1.57	6
Robotics	1.59*	5.79	1.56	6
Statics	1.59*	5.75	1.57	6
Dynamics	1.79*	5.92	1.53	6
Mechanical design	1.99*	6.17	1.09	6
Computer integration manufacturing	1.55*	5.25	1.78	5
Mechatronics practice	2.31*	6.33	1.20	6
Numerical control	1.59*	5.96	1.00	6
Mechanical drawing	1.39*	5.75	1.54	6

*$p < .05$

3. As shown in Table 5, the essential curriculum for mechatronics in the field of electrical & electronic engineering includes: (1) PLC, (2) micro-computer control, (3) sensors technology, (4) power electronics, (5) electrical machinery, (6) electrical circuits, (7) digital design, (8) microprocessor system, (9) electrical instruments, and (10) electronics and practices.

Table 5. *The Essential Curriculum for Mechatronics in the Field of Electrical & Electronic Engineering*

Field Item	K-W test Z-value	Mean	Standard Deviation	Degree of Importance
Electrical & Electronic Engineering				
PLC	2.41*	6.50	.72	7
microcomputer control	2.51*	6.75	.44	7
sensors technology	2.61*	6.48	.78	6
power electronics	1.95*	6.08	.93	6
electrical machinery	1.59*	5.63	1.41	6
electrical circuits	1.59*	5.96	1.00	6
digital design	1.93*	6.04	.86	6
microprocessor system	1.79*	6.08	1.25	6
electrical instruments	2.20*	6.17	1.05	6
electronics and practices	1.99*	6.00	1.18	6

*p< .05

4. As shown in Table 6, the essential curriculum for mechatronics in the field of control engineering includes: (1) automatic control, (2) digital control, (3) micro-controller, and (4) servo-mechanism control.

Table 6. *The Essential Curriculum for Mechatronics in the Field of Control Engineering*

Field Item	K-W test Z-value	Mean	Stand Deviation	Degree of Importance
Control Engineering				
automatic control	2.20*	6.25	1.39	6
digital control	2.20*	6.25	1.07	6
micro-controller	1.55*	5.87	1.45	6
servo-mechanism control	1.99*	5.88	1.30	6

*p< .05

5. As shown in Table 7, the essential curriculum for mechatronics in the field of information engineering includes: (1) computers and (2) computer programming.

Table 7. *The Essential Curriculum for Mechatronics in the Field of Information Engineering*

Field Item	K-W test Z-value	Mean	Standard Deviation	Degree of Importance
Information Engineering				
computers	2.65*	5.92	1.44	6
computer programming	1.65*	5.83	1.43	6

*p< .05

6. The 269 competencies were identified in the study to cultivate proficient teachers in this field. The 269 competencies include 86 competencies in the field of mechanical engineering, 129 competencies in the field of electrical & electronic engineering, 35 competencies in the field of control engineering, and 19 competencies in the field of information engineering.

Recommendations

As a result of this study, some recommendations were proposed for industrial vocational teacher education:

1. The mechatronics curriculum needs to include the fields of mechanical engineering, electrical & electronic engineering, control engineering, and information engineering.
2. Courses identified within each field should be offered to students with a mechatronics major.
3. The 269 competencies identified in this study for mechatronics curriculum should be used to develop learning materials for mechatronics teacher education.
4. The further researchers may focus on how to effectively develop mechatronics field in universities curriculum like: teaching material, teaching methods, teaching time, and teaching equipment.

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Training Upper Secondary School Teachers: The Combined Initial Teacher Education Experiment of Agder College

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Abstract

The Norwegian upper secondary education reform in 1994, *Reform -94*, has been nation-wide and centrally controlled. The main goal of the reform has been the provision of young people between the ages of 16 and 19 with equal access to educational opportunities. Behind this aspiration is both a wish to bridge the wide social gap that previously existed between general and vocational education and a more pragmatic realisation that a country with a declining birth rate must make the most of all potential talent present in its population.

This will have severe implications for upper secondary school teachers, both because there will have to be more interdisciplinary co-operation and because they will meet new student categories. To meet these new requirements, the Postgraduate school of education, Agder College, launched a trial program in 1996, based on two pillars: 1. teacher students of vocational and academic/general background will attend the same course, and 2. a major part of the responsibility for pesonal/professional growth and development is placed with the students themselves, working in small groups with strong interaction between theory and practice throughout the entire course. A requirement for admission to this part-time program is access to own classes.

The Need for a New Approach to Teacher Education

There are two types of postgraduate education for upper secondary school teachers in Norway, one for students who are qualified for teaching academic/general subjects, and another for teachers qualified for vocational subjects. Both are one-year courses if studied full-time.

The new upper secondary school that emerged after *Reform -94* is a comprehensive school, and in vocational studies, (especially) at the Foundation Course level, the students are to spend approximately 26 per cent of their school time on theoretical subjects. In these subjects the students will be instructed by teachers with an academic background, while in vocational subjects they are taught by teachers with a vocational background. This means that a far stronger emphasis than before is laid on the teachers' ability and willingness to co-operate and engage in teamwork. We are of the opinion that Norwegian teachers are poorly prepared for the new teaching and working conditions prevailing in the new upper secondary school, particularly when it comes to interdisciplinary project work, a highly esteemed pedagogical approach to learning in the new curricula designed after the reform.

Moreover, we are of the opinion that it is a condition for a successful outcome of a reform in the school system that the teachers are well prepared for the new practical and pedagogical demands that the reform implies, that they are well informed about the basic ideas behind the reform, and that they are able to assume a positive attitude both towards themselves as groups, regardless of background, and to the changes reshaping the educational system.

We feel strongly that part of the reason for the lack of a parity of esteem between academic/general and vocational education stems from the teachers' own attitudes towards each other as groups and towards the educational pathways that they represent. We think that a form of teacher education that brings these two teacher groups together has a fair prospect of breaking down the negative attitudes and uncertainties that have traditionally coloured their relationship. Collaboration in a shared teacher training environment helps them to learn to know each other as persons and to acquire an understanding of their respective educational and vocational backgrounds.

We hope that such combined teacher education will give us a reasonable chance of building up mutual respect and more positive attitudes. If we succeed in this, the attitudes and knowledge gained by these teachers-to-be through their training may generate a general parity of esteem within the education system, and thus also convert public opinion to equal regard of academic and vocational education.

Needless to say, *Reform 94* will have an impact on teacher training and teacher education in Norway in the years to come. In September 1996 a Government White Paper (NOU 1996:22) titled "Teacher Education: Between Demand an Ideal", said the following concerning the need for change within teacher training and education for the upper secondary school system: "The reforms (in the educational system, in the 1990s) lead to, among other things, co-ordination within as well as between the various parts of the educational system. In the various lines of study within upper secondary education, teachers of general/academic and teachers of vocational background will work together. The common Core Curriculum lays down the overarching and fundamental principles for contents and method in primary, secondary and adult education. This requires co-ordinated and common parts in all types of teacher education. The various groups of teachers, who will co-operate in their later careers, should, if possible, meet and co-operate while still students ...... The education (of teachers) must be based on relevant practice ..... The theoretical part of the study should be a tool for extension, interpretation and reflection around the practical work as a teacher" (p. 147).

At Agder College, we feel we made a good start when we worked out our trial program for a combined education for general/academic and vocational teachers in the autumn 1995/spring -96, described below.

Content and Organisation of the New Initial Teacher Education at Agder College

The combined programme of study is a trial in harmonising the training of teachers in vocational and academic subjects or lines of study. The basic idea is that teachers who are expected to enter into committal interdisciplinary co-operation as school faculty members, will be better prepared to develop such collegial relationships if they go through a harmonised programme including reciprocal, committal elements of co-operation and development work during their teacher training period.

In addition to including general pedagogical theory and practice, this programme is also a meeting place and an arena for co-operation between the two types of students. These represent in some ways very different cultures, both in terms of training and profession: the teachers of academic subjects, with their traditionally academic educational background, and the vocational teachers with their more professionally oriented perspectives and hand crafting traditions. This creates a number of kinds of differences which are highly significant for the teaching profession, including basic differences in their views of training, teaching and learning. While differences in culture (established values, ways of doing things and world view) can create problems for co-operation across traditional groupings, they also create a great potential to influence and learn from one another. It is this potential for mutual growth and development which this programme aims to promote. The goal is that the students can bring positive experiences with them to their future jobs as teachers. The following aspects are considered crucial to the (successful) outcome of the programme:

Counselling of Teaching Practice by Colleagues

At the start of the programme, interdisciplinary groups (core groups) are established with about 4 students each. The groups will have responsibility for providing guidance and counselling of each other's teaching practice. This is a very central element of a programme which is to qualify the students to work with development of other people's competence.

Each student must commit him/herself to actively contributing to counselling their fellow students and colleagues regarding the way they perform their professional tasks. The extent of this work is 4 hours every other week throughout the academic year, a total of 60 hours. During these hours each student is required to free him/herself from other duties in their teaching position. In exchange for this, the student will also receive visits and guidance on their own practice. The goal is to develop the student teachers' actual competence for their work as teachers.

In order for this arrangement to function well, the students are given a theoretical introduction to and practical training in pedagogy of counselling and counselling by colleagues. In addition, the college sets aside resources for following up the groups of teaching colleagues out in the schools. The students will have to demonstrate creativity and flexibility in order to find practical solutions to make the arrangement work in practice, and in addition they must be willing to take responsibility in their role as counsellor. It is recommended that students who cannot or who are not willing to take on such responsibility should apply for other programmes of study.

Theory and Practice: Dialogue and Real Life Experiences

The unique feature of this trial programme is that while they are studying, the students are also practising teachers and thus have access to their own classes. In other words, one has access to an arena for practical testing, development and reflection over the pedagogical theories that are presented and the topics that are discussed in the seminars every other Thursday and Friday. One of the fundamental ideas behind the trial programme is to exploit this opportunity to the fullest extent possible in order to develop the students' actual competence as practising teachers.

The same core groups of students that are involved in counselling each other as colleagues also provide the starting point for the practice-oriented innovation work. Based on the ideas from the theoretical instruction - combined with issues and challenges in each student's class or teaching situation - problem areas which one wishes to work with further will be defined.

Co-operation in Interdisciplinary Projects
During the first year of study the core groups of students that are the basis for the counselling by colleagues will conduct an extensive interdisciplinary project as part of the programme to qualify them for interdisciplinary co-operation in the school.

Findings and Conclusions

In sum, our expectations to this part-time teacher education project are that it will have both short- and long-term effects. In the long run, we hope to contribute to a more down-to-earth and also more relevant teacher education, but as of today, we know nothing of any such future effect. What we do know something about today is how the students have experienced the program and the reflections of students and teachers half-way through the entire process.

1. What is the student experience with the effect of the work in core groups?

Originally, all groups were positive to this way of organizing a major part of the work in the program. They felt that this would be exciting, challenging and give a fairly easy workload on the individual participant. The experiences so far are the opposite: this has not been easy. Project work with people from different schools, with different professional backgrounds, has been very demanding. Some groups have functioned well. Even if time-consuming, they have managed to reach an agreement on various questions, and a common platform and understanding of how to do things. Also in these groups there may have been great variations as to professional competence and world view, but people have been willing to listen to each other and accept the fact that sometimes you have to compromise. (student report -97)

None of the groups say that this has had no value. Even though group work has been time- consuming, conflict-producing and frustrating, it has also been professionally enriching, according to student evaluation.

One problem in particular has been difficult to handle in some groups: participants who are out for a free ride. Where the problem has been dealt with openly, this has contributed to a solution and to an improvement in working climate as such. Still, it is a fact that some students contribute relatively little and others much to the final outcome and the process itself.

Some students are of the opinion that the professional outcome of project work in core groups may be so, whereas the social and processual experiences are very rewarding. It may be that profession and process overlap in this student evaluation - i.e. that what they term "process" is also some kind of relevant professional competence. (Student report -97)

Access to qualified guidance when needed is one important prerequisite for successful work in core groups. The teacher/counsellor at the group's disposal must be willing and able to intervene with distinct feedback when asked to. She has to give clear messages as to what is professionally approved, and what is not, students say in their evaluation of the course. (Student report -97)

2. Has the work in the core group helped develop the participants' competence as teachers?

The answer to this question naturally depends upon what is meant by teacher competence. If being willing and able to listen to other people's opinions and wishes, to submit to majority rule even when disagreeing heartily, to compromise, to receive help from colleagues when needed, in short, be a team worker, if these are important parts of teacher competence; then the answer is definitely yes. However, if teacher competence goes more in the direction of: handling classroom defeats and victories alone, planning based on textbook and own experience alone, being more concerned with the fate of own ideas in interdisciplinary cooperation than with the overall benefit of the pupils, being evaluated as a teacher on the basis of individual achievements and not on the ability to cooperate; then the answer is no, teacher education and training would fare better with less importance attached to work in core groups.

The problem with the question is that the respondents to a very small degree have alternative ways of working to compare with. What still gives validity to the answers is the fact that most of the students have teaching experience and thus know what type of competence is relevant. It is therefore important for the evaluation of the trial program that the majority of students estimate work in core groups as important for the development of their own competence as teachers. It may be that just because these students have teaching experience, this more experience-based group discussion is extra rewarding. Students without this experience may not feel the same about this part of the program. (Student report -97)

In any case, there is no doubt whatsoever that the new curricula for elementary and secondary schools stress the importance of teachers' ability to work in teams with interdisciplinary projects. (Core Curriculum for Primary, Secondary and Adult Education in Norway).

3. What has been the effect of both giving and receiving colleague counselling, to and from academic as well as vocational teachers?

This may be the area in which this trial program for combined teacher education has had the greatest effect. The effect has been significant, both because the students have learnt a lot from each other about what is important in their teaching careers, but also because through this way of organizing the course, we have been able to utilize a resource among students that other teacher education programs have been able to utilize to a much lesser extent. Student reports say that receiving feedback from fellow students, particularly students with a different professional competence than their own, has been very instructive. It often happens that a fellow student, who has committed herself to giving feedback, see different aspects and connections than yourself. By paying attention to such feedback, own consciousness about own behavior is extended and made clearer, students say.

Giving feedback is also rewarding, and a new experience to many, at least on this level. It is demanding, among other things because your attention has to be directed both towards the case in study and towards the person who is to receive the counselling. Our experience is that when students enter their new role as counsellors, most people focus more on giving their "expert" opinion about what is going on in the classroom than on how the person being counselled justifies her actions. Students find it most satisfying, both to have some of their own presuppositions confirmed and others invalidated. Being evaluated by fellow students is a good starting point for learning and further development as a teacher, students say in their reports.

However, close follow-up of the core groups is absolutely necessary to make them practice the prescribed method on all points. (Handal & Lauvås,1996)

The groups need to be made aware of the importance of giving specific orders to their counsellor to make her feedback to-the-point and to raise the general level of pedagogical reflection. Our experience, at Agder College, is that the college teachers of pedagogy have an important responsibility to sharpen the student requirements, and to contribute with feedback on the general development of the group as such.

It is also our experience with this trial program, that at schools where counselling by colleagues is being actively used as part of teacher training, the effect rubs off on the entire faculty. This may have the possible future effect that the method is introduced as an ordinary form of self inflicted further development within the teaching profession.

4. Has this combined program for teacher training helped bridge the gap between the cultures of academic and vocational teachers?

This was originally the main purpose of the experiment, not just to level out differences, but more to utilize the potential in the very differences themselves. Student reports seem to underline the value of the opportunity to meet and face the other teacher type personality. A great variety of fundamental issues and questions have been raised and made relevant throughout this first half of the study program, in discussion sessions and in the planning of various tasks pertinent to this teacher education project.

Whether this will contribute to improving the status of vocational lines of study, is hard to say. However, we have experienced a growing feeling of reciprocity which gives promises for an increased understanding that both groups, together, have important contributions to make in the Norwegian upper secondary school system.

To teach this combined class of student teachers has also been a special experience for the college teachers of pedagogy since most of the students have a teaching position already. This has given a unique opportunity to focus on the relationship between theory and practice. The students have brought their own experiences from the classroom with them to the theoretical sessions at the college, for discussion and exemplifying. Likewise have theoretical stuff from lectures been immediately transplanted to the classroom, for testing or control. This situation has provided unique pedagogical opportunities, opportunities that may not have been fully exploited, according to our students. (Student report -97).

5. Future implications

We can foresee further development of the post-graduate teacher education in two directions, based on our preliminary experiences with the above described trial program. First, we believe that the future education will focus more on the theory-practice dimension than what has been the case in traditional teacher training. The main goal is to create a realistic, fruitful interaction between classroom experiences and the theoretical field, the way we see it described in books and research reports. Second, we think it is of paramount importance to further develop the system of colleague counselling. This method holds great pedagogical potential, also to release an important student resource within teacher training. Through the creation of good environments for mutual student counselling, valuable insight and opportunities for development of skills required by future school systems are gained.

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PART IV

IMPLEMENTING NATIONAL STANDARDS AND QUALIFICATIONS: IMPLICATIONS FOR THE INTERNATIONAL LABOUR MARKET

Do Joint European Vocational Training Standards Stand a Chance? Recognition and Transparency of Qualifications

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Abstract

The paper describes chronologically the attempts of the European Union to achieve a common vocational training policy, harmonize educational and training standards in order to support the free movement of labour, and develop a free European space for services. Despite some advances in the recognition and comparability of professional and vocational qualifications, at the political level progress in this matter has been rather limited. Education and vocational training systems and bureaucracies seem to resist a harmonization of their structures, as often do the social, labour law and collective agreement reference systems as well. More recently, the question of whether to deepen and/or expand the EU and the introduction of the EMU has once again turned attention from the establishment of a joint vocational training policy and the development of minimum criteria and standards. An understanding of the historical build-up leading to the current deadlock threatening on all sides may help to avert a stalemate if correct conclusions are drawn from the experience, successes and failures to date. After taking stock of the situation the author makes a few recommendations for the work to come.

Introduction

This contribution is describing chronologically the attempts of the European Union to make progress towards a common vocational training policy, the harmonization of educational and training standards in order to support free movement of labor, which includes a common vocational training policy, as well as the development of a free European space for services, two of the main pillars of the EU.

Since progress in this matter at the political level has been rather limited, this will be an attempt to describe the situation from the viewpoint of someone who has been professionally committed to the subject for more than 20 years. An understanding of the historical build-up leading to the current deadlock threatening on all sides can perhaps be of use to avert such a stalemate if the correct conclusions are drawn from the experience, successes and failures sustained to date. For this reason, the author[1] will start by attempting to take sober stock of the situation and proceed to make a few recommendations for the work to come.

In the light of the changing competencies and approaches of the Community and the European Union we can distinguish three main stages

1. The harmonization stage
2. The approximation of training levels' stage
3. The stage of convergence

1. Harmonization Stage from 1957 to 1973

The Treaty founding the EEC with its initial six Member States in 1957 (from 1973 onwards nine Member States, nowadays 12 Member States) included vocational training policy among the areas to be harmonized both legally and de facto. It was assumed that the systems were to be brought closely into line with each other, should be made not only comparable but should rather be merged in order to permit a quasi mechanic mutual recognition of qualifications, diplomas and vocational certificates. Vocational training policy in the Community was considered an important and integral part of the political will to approximate living and working standards throughout the Community. An expression of this intention was the adoption of the "general principles for vocational training" laid down by the Council of the EEC in 1963[2]. These principles shaped the approaches pursued up until the mid-1970s and were in force till the Treaty on the European Union has been ratified. Most of these principles, such as teaching all young people vocational training qualifications before they finish their (compulsory) schooling, have been put no more than partially into effect in the mean-time.

Concurrently to this, up until the mid-1970s recognition of vocational qualifications was pushed ahead as one way of facilitating the full mobility and right of the self-employed and members of the liberal professions in particular to establish a business on the basis of Article 51 of the Treaties. Approximately 15 directives, pertaining especially to health occupations, had been adopted by 1974: doctors, pharmacists, nursing occupations, etc. and architects. The drafting of these directives at that time presupposed setting common minimum standards on the length and contents of training, a process accompanied by lengthy negotiations. For example, more than eight years' work went into the directive on architects.[3] These directives are still valid today. Some of them have been updated in the mean time, they all are still in force. In addition a number of transitional directives have been approved which in the mean-time have been replaced by definitive ones permitting the delivery of services throughout the Community for instance in hairdressing.[4]

The establishment of the European Social Fund and later the European Regional Fund, the European Communities' main interventionist mechanisms, which ought to promote the approximation of living and working standards throughout Europe, had an import impact on the training policy in some Member States already at this stage. The former in particular allocated quite substantial resources to disadvantaged regions of the EEC, especially to build up and extend their vocational training systems and to combat their prevailing unemployment. Approximately 80% of the money of the Social Fund went towards the retraining, late training and continuing training of the unemployed or those in danger of becoming unemployed. Initially these funds played only a minor role in building up and extending initial vocational training. This changed towards the end of the 1970s and even more in recent times when the criteria were modified to include support for Member States to build up and extend their full-time and part-time school and non-school initial vocational training systems. It is only very recently that the Social Fund has begun to take an active interest in the development of common standards. Some of the so-called Community initiatives did promote new standards especially in the framework of the continuing education and training of adults.

Some segments of the initial education and training in quite a number of Member States have been developed in line with debates on the European level: For instance the former 'Höhere Fachschulen' including the Ingenieurschulen have been upgraded in the early 70's in order to include these into the Higher education level as so-called 'Fachhochschulen'. The German student movement has been pushing the authorities to do so, because they did fear a downgrading of their qualifications by comparison to French schools for engineering education/training. Parallel developments have been taken place in The Netherlands and in Belgium. Later-on in the UK quite a number of former colleges have been upgraded too in order to get polytechnics which were permitted to teach for university degrees.

The organizations of the social partners and professional associations played a vital role from the outset in accompanying the EEC on its path to develop a common vocational training policy especially on the sub-university level. They were called upon to participate as equal partners alongside government representatives in the various consultative committees with the Commission in Brussels. Because of the consensus principle, which did not permit majority decisions, the competent authorities nevertheless did often block each other and could only reach agreement on a rather low common denominator. This only changed in the second half of the eighties after the Single European Market agenda was passed and the Single European Act and the Social Charter were adopted (see below).

In retrospect we can say that hardly any common EEC vocational training policy could be implemented during this phase. The general principles of 1963 had scarcely any impact on bringing the systems much closer with each other, despite of some trends into this direction. However, the discussions that took place and the resultant directives on the recognition of academic and/or training qualifications of professionals and liberal occupations and, to a certain extent in a limited number of Member States, the interventions of the European Social Fund left a stronger mark, promoting a certain approximation of the education and training systems.

2. Approximation of Training Levels Stage from 1974 to the End of the 1980s

Since the EEC was not responsible in the narrow sense for educational policy, but educational policy was a top priority issue in virtually every Member State during this phase, there was keen interest to find a way to be active in this area too while complementing the prevailing economic and social policy priorities in respect of a common vocational training policy. Despite the lacking legal basis for a common education policy loopholes were found so that Ministers of Education and education ministry officials from all over the EC could meet even if not as a formal Council meeting. These meetings were quite separate from the Council of Labor and/or Social Ministers which has been and still is responsible for vocational training: The Ministers of Education met at the "Council of the EC". The first of these meetings, which was held in 1974, took place on the initiative of the former Commissioner, Dahrendorf. The Ministers of Education concentrated on four main areas for their subsequent joint activities:

- the transition of young people from school to work and adult life and their vocational preparation within compulsory education at school;
- equality of opportunities for girls at secondary schools;
- the training and continuing training of the so-called second generation of migrant workers, as foreign employees used to be called at that time; and
- promoting closer European cooperation at higher education level.

In the more narrow field of vocational training, the same period saw the founding in 1975 of the European Centre for the Development of Vocational Training, Cedefop, with its headquarters in Berlin (West). It has recently been moved to Thessaloniki. This agency is responsible for drawing up relevant documentation, for disseminating information and contributing to a joint vocational training policy by developing cooperation in research, i.e. providing consulting services to governments and supporting Member States in their efforts to develop vocational training systems. In the foundation statutes of the Centre, mention is being made of the need to approximate/harmonize training levels, so that recognition of qualifications can then become a reality.

A whole range of Cedefop studies and EC-education and training programs, which had meanwhile been launched, led in the mid-eighties to extensive projects in the field of vocational training: PETRA, FORCE, Eurotecnet, Comett, (see list of abbreviations in annex 1) etc. effectively boosted cooperation and innovation in fields such as the training of young people, in-company continuing training, and cooperation between universities and institutes of higher education with trade and industry. These activities and programs did merely promote exchange programs for pupils, trainees, students and teachers and had a certain impact on the debate about standards, although rather short-lived.

In addition to the above-mentioned programs, the decision of the Council on the Comparability of vocational training qualifications among the Member States[5] was passed in 1985 following lengthy preliminary discussions by EC committees and preliminary studies by Cedefop. This decision did intend to make a first step on the way to recognizing qualifications for salaried workers too. It was initially limited to the skilled blue and white-collar worker level, and did initiate the setting up an information system to facilitate effective comparisons between training offers in the Member States. Its aim was to promote the mobility of employees for whom the recognition directives did not apply.

This Council decision did introduce a five level training structure ranging from semiskilled workers (level 1) to the professional or university graduate level (level 5), while concentrating on the so-called level 2 (skilled blue and white collar worker level)[6].

Cedefop did implement this Council decision on behalf of the Commission and the Member States and did carry out studies; experts including the social partners held discussions on a total of 19 sectors, more than 200 occupations have been retained. These activities had been dealt with and the competent authorities of the Member States had reached agreement on them by the end of 1993. The results had diverse repercussions in the Member States and stimulated important developments in skilled worker training in almost every country. The comparative tables have been published in the Official journal of the EC and the Member States did inform their citizens on the results in order to permit their utilization in a situation of mobility[7].

This system enabled an effective comparison of vocational training qualifications throughout the twelve Member States. It found widespread application as an information system for employees and employers to identify certificates and qualifications from different countries and to establish equivalencies. Even though the results are not legally binding in themselves, interested parties nevertheless had a reference point to assert their right to equal treatment in their occupation, equal pay and career opportunities as foreseen in the free movement regulation of 1968[8], according to which no host country may discriminate against anyone who has undergone his or her school education or vocational training in any other Member State.

Although the Council decision of 1985 was not necessarily intended to harmonize vocational training policies or to bring offers into line with each other, the comparisons did in fact result in a certain trend in this direction: Many Member States drew on these comparative standards and the jointly written job descriptions and structure of training levels when reforming their own vocational training systems and they continue to do so today. Member States with firmly established structures for vocational training such as Denmark and Germany have likewise turned to the results and the discussions held during the comparability exercise when updating their systems. In retrospect one can justifiably say that this work under the overall control of Cedefop was anything but unsuccessful, despite the fact that in the area of direct recognition of qualifications only a first step has been made, and others will have to follow.

Heretically, one could maintain that its success in identifying deficiencies in the type and scope of skilled worker training (irrespective of whether we are speaking about initial or continuing vocational training) was precisely one of the reasons why this exercise has so far not been continued or enlarged to cover other levels than the skilled workers' one.

Although the Council decision is still in force and the results are being utilized in a variety of ways to promote skilled worker mobility throughout the EU, the Commission did not propose an extension of the comparability procedure to other levels or continued with the remaining occupations and sectors basically because a number of Member States have expressed political reservations. However, the results produced are in danger of becoming outdated if it is not continuously updated, as was the intention in the decision of the Council and would be necessary in view of the dynamic changes in education/training and jobs.

Furthermore, many of the new Member States and associated countries draw on this system and use the occupational descriptions as reference profiles for adapting their own structures. They are likely to retain their use as a common denominator even if they can not necessarily be considered as fulfilling the function as minimum standards in their current form. In order to do this, the descriptions would have to be far more detailed, outline the required knowledge and competencies in a broader sense in addition to describing the skills needed for the job. Reference to these profiles would be helpful, however, if one wanted to make fast progress at sector level in the debate about European standards. These profiles and the comparative tables could also have been used as reference documents in the debate on social dumping e.g. for building and construction workers.

During this period EC-labor market programs were launched in parallel to the education and vocational training programs . They were called Community Initiatives and were intended to complement the normal Social Fund interventions and prompt innovation and cooperation in the Member States. IRIS, Now, Euroform and Horizon (see list of abbreviations in annex 1) were but a few of the programs designed for special target groups with the aim of improving their situation in the labor market through better vocational training. About 10% of annual Social Fund resources flowed into these innovative target group and partnership programs. Alongside the orientation on new qualifications necessitated by the spread of new communication and information technologies, an orientation on target groups was typical of this phase in the development of a joint (vocational) education and training policy.

An important new stage in the development was the adoption of the Single European Market program and the reform of the treaties in 1987. This also had an impact on development in education and vocational training policies. The Council introduced the principle of qualified majority and strengthened the co-decision rights of the Parliament in the areas that were important for the full establishment of free mobility of goods, services, capital and persons, the so-called four basic freedoms of the EC. The "social dialogue" between employer and employee social partner organizations was likewise institutionalized. A fresh start was made to speed up and make the lengthy recognition procedure more effective. Directives for the general recognition of university qualifications and other vocational qualifications for regulated occupations for which state or state recognized vocational qualifications are indispensable were prepared and adopted in 1989 and mid-1992. Various occupations in the health, educational and legal systems of the Member States come into this category as do social welfare, merchant shipping and other occupations. These directives as well as some of the above-mentioned education and vocational training programmes were passed for the first time by a qualified majority, which because of the complicated weighting of votes de facto corresponds to a two-thirds majority.

In spite of these two major Community instruments ("comparability" and "recognition"), many questions remain open in the implementation practices of the Member States. Open or covert protectionism tends to be the rule rather than the exception and despite the existing unambiguous legal situation, many employees and self-employed have a very hard time asserting their demands for equal rights and treatment. Often, the regional and national authorities who are supposed to be responsible have no clear allocation of competence and are unable to give definitive information. Binding comparative standards similar to those in the comparability system would be of great benefit for applying the recognition directives on regulated occupations. They would help to prevent arbitrary interpretation and relieve those concerned from the obligation of having to furnish proof.

The education and vocational training systems and the bureaucracies seem to resist with all their might any influences in connection with a 'Europeanization' of their structures, as often do the social, labor law and collective agreement reference systems as well. It seems that the more the other policies such as the economic and monetary ones are being harmonized, the more the Member States seek to secure their competitive edge in the remaining areas and seal themselves off from the others. The oft lamented lack of effective comparisons is frequently nothing more than a pretext for legitimizing the restrictive practices of the competent authorities and the social partner organizations in this area. At the same time effective comparisons are often shunned, however.

The social dialogue, which got started in many of these areas in the late 1980s, was not able to help to open the systems either. Although the Social Charter[9] made progress possible in the direction of securing social and vocational training standards, the blocking tactics of certain Member States[10] prevented effective advances from being made, even though the positions of the social partner organizations had become much closer in many cases. However, the roots of these problems can on the whole be traced to structurally based, persistently too high unemployment in almost all Member States coupled with the ongoing existence of different social and vocational training standards and the resultant protectionism.

Any intervention in vocational training in the course of this phase, and such intervention was mainly founded on social and labor market policy considerations, and the attempt, not necessarily to integrate the systems all together into one and to make them comparable, must be considered more or less as failures. The blame for this must be put not only on the real difficulties which cannot be denied, but also to a great extent on the above-indicated blocking tactics of certain Member States.

Nevertheless the expected rise in mobility going hand in hand with the implementation of the interior market, which in itself would have pushed for the abolishing of barriers to such a mobility, has not been occurred to this extent. Nevertheless it has to be reminded, that mobility problems are equally linked with foreigners which want to reintegrate in their country of origin after having received an education or training in the host country.

3. The Stage of Convergency: Maastricht and the Consequences for a Common Educational and Vocational Training Policy in the EU

The treaty on the formation of a European Union, which was ratified by all Member States in 1993, included educational policy for the first time and redefined competencies for vocational training among other things. If in the past there had been a formally strong competence which for the above reasons was scarcely exercised, it was now cut back on the one hand while extended to education on the other. For both vocational training and education, it was declared that the EU was to have only a predominantly supplementary and supportive role in developing a joint policy and could bring the systems into line in a legal sense only in those areas which were directly connected to free mobility and social standards. Here it is worth noting that the objectives of the Social Charter were in fact confirmed in an additional social protocol and they could also be implemented with a qualified majority (with the exclusion of the United Kingdom, which did not sign the Social Charter at the time either), but they were not included in the Treaty of the European Union. This issue will probably be included in the inter-governmental conference planned for 1996/97.

The new Article 126 on education and Article 127 on vocational training lay down in detail the objectives of the joint policy. The previously launched programmes were grouped together and re-tailored on the basis of these paragraphs. Socrates and Leonardo were started in 1995 in addition to another programme called Youth in Europe.

The White Books[11] of the European Commission on economic and employment policy and on social policy give top priority to education and vocational training, placing special emphasis on the need for human resources to adapt to technological, structural, social and economic change in view of the internationalization and globalization of the economy and society and the development of the information society. Complementing this, the current Commission recently published a White Book entitled "Teaching and Learning, towards the Knowledge-Based Society" which outlines the consequences of these developments on education and training systems and attempts to set priorities for EU policies for the coming years[12]. It places less emphasis on the mutual recognition of what already exists and more on the "validation des aquis" or rather "accreditation of prior learning" or "late qualification", stressing continuing training and on-the-job experience. It also emphasizes core skills and modular development at European level as well as the national level and would like to see recognition ex post or at a later stage as part of a renewal of the systems themselves. Is the Commission (or at least its Directorate General XXII, responsible for education, training and youth) saying goodbye to the immediate establishment of recognition or comparability or transparency of qualifications? Is it ploughing a new field without tilling the old one properly? It seems that the Commission will attack the problem on different fronts. A new start is to be expected in 1997[13].

In the meantime the EC or rather the EU has undergone major upheaval through the opening up of Eastern Europe, through its expansion adding three new Member States to its number, through the formation of a European economic area and the association of a number of other countries. The question of whether to deepen and/or expand the EU continues to be a point on the agenda, the introduction of economic and monetary union in the wake of implementing the Maastricht Treaty is high on the priority list in discussions, with education, vocational training and social issues in danger of being pushed into the background again. This means that a joint vocational training policy that deserves the name, and with it the development of minimum criteria and standards, once again run the risk of being put onto the back burner, although they comprise a vital element of the social dimension of the EU and could certainly promote the mutual trust, cooperation and economic and social cohesion of the EU and thus effectively support the implementation of the European Monetary Union. This danger lurks despite the increased awareness of objective necessities and the challenges that lie ahead (see the White Papers quoted in the respective end note).

So long as no substantial progress is made towards political union and the Member States block each other and retreat into a legal free-for-all, there will be no chance of attaining a joint vocational training policy or laying down common minimum standards, despite the opportunities carved out for this in the Maastricht Treaty and in the additional social protocol in particular.

4. What Is to Be Done?

The following lessons can be learnt:

a) The aim to develop a common reference framework for qualifications and occupational profiles with a promising future will probably be undisputed. What will be disputed is the degree to which they are binding. We are in favour of the principle of the competent authorities in the Member States participating voluntarily, taking the social partner organizations into account. We are likewise in favour of a decentralized decision on whether and to what extent the results are turned into national legislation and collective agreements. The prerequisites need to be improved at EU level so that the expertise, which is frequently available, can also be used effectively and so that the social partner organizations in particular can be included in an appropriate manner in this work. Because of its four-part structure (the social partners, governments and the Commission are represented on its Management Board); Cedefop is particularly well-suited for such an endeavour, all the more so since the Centre exercises mere consulting but not executive functions. One would have to or could begin with a few of the sectors or occupational fields which have already been dealt with in the comparability system or in Cedefop's work on occupational profiles. This could be followed up by discussions on joint job descriptions, i.e. occupational profiles and competencies (e.g. trade and commerce, tourism and/or construction). The availability of a scheme to analyze and observe occupational and qualification trends would be a must for this in the medium term, however. The research network on trends in occupations and qualification developments[14], set up recently by CEDEFOP, could be of great assistance in this matter.

b) The participation of the Member States in such work and parallel endeavours will presumably be possible only on a pure voluntary basis, i.e. the results of the work would not be directly binding so long as they were not be applied by the competent organizations themselves. The Member States and the social partners would continue to be completely autonomous in deciding whether and to what extent they chose to use these results. Given enough effort, we feel certain, however, that most Member States will participate and, depending on current practices, the social partner organizations as well.

c) On the initiative of the Commission and with the support of Cedefop, work should begin right now on improving the institutional requirements needed for a regular exchange of information and experience in the area of qualification trends and comparisons:

- The work begun on the individual portfolio, on the network of qualifications data banks and on setting up reference centres on the information about and the assessment of foreign qualifications at national or even regional level, which is being pushed ahead from now on as part of the Leonardo da Vinci programme[15], should be given the support of all involved and the results of these projects should be put into practice as fast and effectively as possible.
- These pragmatic steps may help to limit the frustration caused by the somewhat moderate progress of the EU in this quite sensitive political area, while paving the way for effective progress beyond what has been achieved so far for the people living in the EU, for its employees and employers. Even if it is not and cannot be the goal to force people into mobility, it is nevertheless quite natural for them to want to have their qualifications assessed fairly, if only to reserve their right to move freely within Europe or merely in a neighbouring country and even if they never in fact make use of that right.

Furthermore, with markets coming into line with each other and comparable standards being introduced for products and services, qualification requirements will also be brought into line with each other, whether one wants it or not. This also goes hand in hand with an acceleration in the exchange of information and experience. In contrast to this, there seems to be an increase in the individualization and subdivision or rather decentralization and regionalization of careers, occupational decisions and employment prospects. Bringing qualifications into line with each other for reasons of economic necessity will always be relative and can certainly not be an end in itself unless it is integrated in the development of humane, social and ecological standards, i.e. in the political and cultural development of Europe and more than that (see above). The attractiveness of vocational training and the acquisition of qualifications depends to a great extent on whether they heighten occupational and geographic, in-house and external mobility. The development of reference standards is urgently needed for assessing, validating and accrediting competencies fairly, even and precisely in times of growing disorientation fed by structural changes upsetting the status quo at every level (local, regional, national, European, and international/global).

Annex 1

List of abbreviations

- Cedefop: European Centre for the Development of Vocational Training
- Comett: Programme on cooperation between universities and enterprises in the field of technology, Community action programme in education and training for technology from 1986 - 1994
- EC: European Communities
- EEC: European Economic Community
- ERASMUS: European Community action scheme for the mobility of university students from 1987 - 1995 (from 1996 onwards integrated in Socrates)
- EU: European Union
- Euroform: Community initiative concerning new qualifications, new skills and new employment opportunities from 1990 till 1994
- Eurotecnet: Community-wide network of demonstration projects in the field of new information technologies and vocational training from 1990 - 1994 (from 1995 onwards integrated into Leonardo)
- Force: Community action programme for the development of continuing vocational training from 1991 - 1994 (from 1995 onwards integrated into Leonardo)
- Horizon: Community initiative concerning handicapped persons and certain other disadvantaged groups from 1990 - 1994
- IRIS: European Network of Training projects for Women from 1988 - 1993 (from 1995 onwards integrated into Leonardo)
- LEONARDO: European Union Programme on Vocational Training
- LINGUA: Programme to promote foreign language skills in the European Community from 1990 - 1994 (from 1995 onwards integrated in Socrates or respectively in Leonardo: Action programme for the implementation of a European Community vocational training policy from 1995 - 1999)
- NOW: Community initiative to promote equal opportunities for women in the field of employment and vocational training from 1990 - 1994
- PETRA: Action programme for the vocational training of young people and their preparation for adult and working life from 1988 - 1994 (from 1995 onwards integrated into Leonardo)
- TEMPUS: Trans-European mobility scheme for University students from 1990 - (exchanges with Central and Eastern European states)
- SOCRATES: Action programme for the implementation of a European Community education policy from 1995 - 1999
- Youth for Europe: Action programme promoting the exchange of young people in the European Community from 1988 -

Annex 2

Outcome of the Comparability exercise, which has been implemented on behalf of the European Commission by CEDEFOP:

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OVERVIEW: Publications on the comparability of vocational training qualifications between the Member States of the European Community in OJEC (Official Journal of the European Communities)

Sector/occupational group	No. of occupations conjointly dealt with at EC level	Published in the OJEC
Hotel and Catering Industry	8	C166 of 3.7.89
Motor vehicle repair	9	C168 of 3.7.89
Construction	13	C292 of 20.11.89
Electrical/ Electronics	10	C321 of 22.12.89
Agriculture	26	C 83 of 2.4.90
Textile/Clothing	9	C253 of 8.10.90
Metal	23	C196 of 25.7.91
Textile Industry	22	C318 of 7.12.91
Commercial Sector	6	C 42 of 17.2.92

Clerical/Administration -Banking and Insurance	6	C108 of 28.4.92
Chemical Industry	7	C262 of 12.10.92
Food Industry	12	C292 of 9.11.92
Tourism	5	C320 of 7.12.92
Transport	9	C338 of 21.12.92
Public Works	11	C 20 of 25.1.93
Iron/Steel	5	C182 of 5.7.93
Leather	12	C223 of 18.8.93
Printing/Media	10	C295 of 30.10.93
Wood	9	C330 of 6.12.93
19 sectors	209 occupations	

Endnotes:

[1] The author is actually responsible within Cedefop for projects on qualifications' trends and transparency

[2] Council decision of 2 April 1963 laying down general principles for the implementation of a common vocational training policy, published in OJEC No. L 63/338 on 20.04.1963

[3] Council Directive 85/384/EEC on the mutual recognition of diplomas, certificates and other evidence of formal qualifications in architecture, including measures to facilitate effective exercise of the right of establishment and freedom to provide services, in OJEC No. L223 of 21 August 1985

[4] OJEC No. L 218 of 27 July 1982

[5] Council decision (85/368/EEC) of 16 July 1985 on the comparability of vocational training qualifications between the Member States of the European Community, published in OJEC No. L 199 on 31.7.85

[6] See annex of the Council decision from 1985, op.cit.

[7] See list of sectors in annex 2

[8] Council regulation (EEC) No. 1612/68 on freedom of movement for workers within the Community, in OJEC No. L 257 of 19 October 1968 as amended by regulation (EEC) No. 312/76 and regulation (EEC) No. 2434/92.

[9] Commission of the European Communities: Community Charter of the Fundamental Social Rights of Workers, Luxembourg 1990; and Agreement on social policy concluded between the Member States of the European Community with the exception of the United Kingdom of Great Britain and Nothern Ireland in: Council of the European Community/Commission of the European Communities: Treaty on European Union, Brussels and Luxembourg 1992

[10] It should be affirmed for the reader that normally the 'bigger' Member states have more resistant attitudes towards the establishment of common standards than the 'smaller' ones.

[11] White papers: 1. Commission of the European Communities: Growth, competitiveness, employment, the challenges and ways forward into the 21st century, Luxembourg 1993, 151 p. 2. Commission of the European Communities: European Social Policy, a way forward for the Union, Luxembourg 1994, 55.p. 3. European Commission: Teaching and learning: Toward the knowledge-based society, white paper on education and training, Luxembourg 1995, 63 p.

[12] See the contribution from Manuela du Bois Raymond

[13] See the recent European Commission's Green paper on: Education-Training-Research, The obtsacles to transnational mobilty, COM(96) 462 final, Brussels 56 p.

[14] This network of researchers has been set up in 1995 called Ciretoq: 'Circle for research cooperation on trends in occupations and qualifications in Europe'

[15] Leonardo da Vinci programme: See Council decision 94/819/EC of 6.12.1994

Implementation of National Standards for the International Labor Market

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Abstract

Industrialized nations throughout the world are experiencing major changes in their societies, including higher requirements for their work organizations and workforces. To remain competitive in the international market and maintain their standard of living, these countries must transform their vocational-technical education systems to prepare new high performance workers.

In addition to acquiring more advanced technical skills, these new workers must also be able to understand and use technological applications, adapt rapidly to changing conditions, solve problems, communicate effectively, work in teams with different types of people, take personal responsibility for the quality of product or service being produced, and have technical skills that can be adapted to rapidly changing conditions. These new requirements are called employability skills.

New vo-tec curricula to provide the knowledge, skills, and level of ability of the new high performance jobs should be designed not only with new industry-based skills standards but also with new academic and employability standards. A two-and-one-half year effort involving twenty five states in the U.S.A. is addressing this need in an effective manner. The Integrated System for Workforce Education Curricula (ISWEC) combines academic, skill and employability standards to provide a new curriculum framework for occupations grouped in nine career clusters. The central components, the Integrated Curriculum Standards, are statements of ex-

pected performance that integrate all three types of standards and drive the assessment strategies to support the curriculum framework.

The curricula resulting from the ISWEC framework are supportive to the Tech Prep reform movement that is now widespread throughout the U.S. It has a strong academic foundation; it begins with broad, core courses, and specializes at the higher grade levels; and it provides for worksite learning with measurable achievement.

An outstanding example of Tech Prep achievement is in the state of South Carolina. Notable features of the South Carolina Tech Prep programs are presented.

Introduction

Rapid advances in technology and the globalization of markets are bringing about major changes in the nature and structure of jobs and work organizations. As a consequence, these labor market changes have caused enterprises and employers to redefine the knowledge, skills and level of ability required of their workers. These definitions are commonly referred to as "skill standards".

A national (and international) system of skill standards is valuable because it can improve communication among employers, educators and labor by: 1) identifying what students must learn to enter employment and what workers must demonstrate to qualify for advancement; 2) providing curriculum development guidance to educators and trainers; and 3) helping employers to recruit and select employees. Although there are many economic, political and labor market implications related to "Implementation of Standards for the International labor Market", I shall choose to discuss the changes in types of standards and methodology used to create curriculum and training programs for preparing new, high performance workers that can enable companies and nations to compete in the new global economy.

High Performance Companies, and Their Workers

Companies successful in international competition have become sensitive to the needs and desires of their customers, have modified their production processes using computers and total quality management approaches and have set new requirements for front-line workers.

High performance companies have discovered that the old, hierarchical organization responds too slowly to the rapid changes required to remain competitive. As a result, they have eliminated most of their mid-management staff and have transferred their tasks and responsibilities to front-line workers. This pattern of change has occurred in business, engineering, manufacturing, health, agriculture and most service occupations. This has greatly changed the skills and capabilities required of the workers who must understand and use technological applications, work in teams with different types of workers, take personal responsibility for the quality and accuracy of their work, and have adaptable skills.

Preparing High Skill Workers Using Standards

Therefore, the design of new curricula to prepare this "new generation" of workers requires the creation and integration of three types of standards:

1) *Skill Standards* - which identify the knowledge, skill and level of ability an individual needs to perform successfully in the workplace. They ensure a common standardized system for classifying and describing the skills needed for particular occupations and the skills possessed by individual workers.

In the USA, new national and state skill standards are being prepared that more broadly represent the needs of large industry groups instead of the narrowly focused "task lists" of the past. We are also asking employers to look forward and focus on the future rather than just describe the incumbent workforce.

2) *Academic Standards* - It is no longer sufficient for workers to know "how"; they must also know "why." High levels of academic achievement in mathematics, science, and communications must underpin vocational education. We require both "head skills" and "hand skills" in the new workplace. Academics for all students must be learned in the context of how they are used; and academic topics must extend beyond those that simply enable a skill or task. Academics should be sufficiently complete and rigorous to assure that a student is eligible to enter further education and advancement training.

3) *Employability Standards* - (Known in the U.S.A. as the SCANS Standards). In high performance companies all workers must now be able to combine their knowledge and skills in complex activities requiring "non-algorithmic thinking."

Employability Standards are those skills and abilities that effective workers in all vocational areas can productively use. They include 1) allocating resources, 2) using interpersonal skills, 3) acquiring and using information, 4) systems thinking and 5) effective use of technology.

The New Standards-Based Curricula - ISWEC

In early 1995, a US consortia of 25 state vocational education agencies empowered the Center for Occupational Research and Development (CORD) to design a new curriculum structure to replace existing vocational education programs. This new education and training system will transform curricula, pedagogy and assessment to meet current academic and workforce standards.

The first step was to design an occupational classification system with nine clusters based upon common knowledge, skills, and abilities of workers. The Integrated System for Workforce Education Curricula (ISWEC) project is designed to link work and education in a meaningful and systemic way. The primary goals of the project are to integrate academic, occupational, and employability skills into a curriculum framework for grades nine through fourteen and to develop a process for educators to adapt the framework to the standards and needs for their local schools.

Emerging standards in academic, employability, and occupational skill areas provide the sources of information upon which the ISWEC model is constructed. A database of more than 10,000 standards have been collected from various sources at the national, state, and local levels. These standards are kept intact as they are synthesized and organized under a clustering system. The integration process and the grouping of clusters is simply a method of organizing skills under three incremental levels from broad to specific or vice versa:

1.) Career Cluster, e.g., Business, Marketing, and Management,
2.) Career Major, e.g., Administrative Support,
3.) Occupation, e.g., Executive Secretary

These three categories of clustering provide the basis by which standards are integrated. Integration of the actual standards falls within these categories to develop Integrated Curriculum Standards (ICS). The ICS is a central component to the ISWEC project. It is a standard, a statement of expectation for performance, one that integrates all three types of standards--workforce competencies, academic content, and employability standards. ISWEC organizes the ICSs in such a way that some ICSs are broad-based and form the knowledge and skill base that crosses the entire career cluster of career majors. Other ICSs will address knowledge and skills at a more specific, career major level. Still others will address tasks specific to the occupational specialty.

The development of these ICSs also drives the assessment strategies used to support this curriculum framework. Each ICS incorporates benchmarks, guidelines, and rubrics to support authentic assessment. Embedded assessment strategies are also included to monitor student progress continuously, provide opportunity for immediate response to student performance, and ensure student achievement meets the level of the standard as it is defined.

The development of both broad and specific ICSs addresses several educational issues raised by participants in school reform. Many issues raised by the state and local consortium partners include: introduction of the relevance of work early in the educational process to avoid losing or alienating students; instruction at a level broad enough to be transferable to complex, real-world problems; and instruction at a level specific enough to develop occupational skills leading to employment and broad enough to change their minds or pursue higher education. ISWEC will result in a system by which state and local educational entities can effectively integrate curricula and teaching methods that address the changing workplace. The system will offer career-preparation pathways that:

- are organized around career clusters,
- are built on occupational, employability, and academic standards,
- build on a strong foundation of contextual, cognitive, and work-related skills through integration processes,
- prepare learners for an ever-changing work world by crossing occupations,
- include authentic assessment components, and
- provides for multiple exit and reentry points between school and the workplace.

Using Industry Skill Standards through Tech Prep Programs in South Carolina:

The Tech Prep initiative began in South Carolina which enabled the state to create sixteen Tech Prep Consortia. These consortia are partners with the state's 16 technical colleges, 91 school districts and business and industry. State and Federal funds flow through the 16 consortia to provide activities that benefit students as they progress through middle school, high school and technical college. Tech Prep is a major restructuring strategy designed 1) to meet the needs of students who want to function effectively in a technological workplace and 2) to ensure that students are better prepared to pursue postsecondary education and earn an associate degree and/or baccalaureate degree.

The mission of Tech Prep in South Carolina is to:

- Establish direct involvement and consultation with business and industry in the development of relevant curricula and performance standards and continuity of learning through the integration of academic and occupational education.
- Empower change at all levels of the educational system as needed by all participants including students, workers, employers, educators and political leaders.

- Encourage students to acquire proficiency in mathematics, science, communication and technological skills.
- Provide a curriculum that will enable students to enter the workforce, continue formal training toward an associate degree or two-year certificate and/or continue to a baccalaureate without experiencing retraining, delays, duplication of courses or loss of credit.

Review and Preview of Higher Vocational Education: Changes in Hong Kong and International Trends

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Abstract

The history of higher education will not repeat itself. Three principal considerations are selected. The first is that higher education systems are moving away from the single subject academic degree to become pluralistic in regard to provision and aspiration. The second is the strong commitment to establish a 'parity of esteem' between vocational and academic qualifications. And the third is that the artificial dichotomy between education and training is now being superseded and subsumed in the concept of learning - lifelong for individuals, organisational for corporate and community bodies.

In Hong Kong and internationally, there should be qualification frameworks that clearly set out the overlap of higher vocational qualifications with so-called academic qualifications. So-called because many of these overlap with professional qualifications. The higher or advanced diploma is deemed equivalent to 'half' of the four year honours degree in related areas. For this to be internationalised and for social recognition, the qualification should be renamed 'Associate Degree'.

Introduction

With the continuing growth of international and multinational commerce, many countries and international bodies are giving urgent consideration to qualifications for a qualified labour force. These include academic, vocational and professional qualifications. For international recognition and for portability, there are also considerations of standards and issues are discussed in regard to particular contexts.

For review of higher vocational education in Hong Kong, two recent and comprehensive reports are discussed. Issues are discussed in terms of 'overlap' of: education/training; vocational/academic; professional/intellectual capabilities; conceptual/practical skills; key/core/transferable skills. Labour market considerations are also discussed together with effects of supply and demand in regard to 'graduate substitution'.

Examples are given to illustrate international trends and directives of the Council of the European Communities. The paper is the culmination of a series of studies (Imrie, 1992-97) of higher vocational education in Hong Kong related to international developments.

Contexts

Review of higher vocational education in Hong Kong is based on two reports published in 1996; the Strategic Plan of a Hong Kong university is used to illustrate a model for incorporating higher diploma and degree qualifications.

- Higher Education in Hong Kong (UGC, 1996)
- Strategic and Organisational Review of the Vocational Training Council (SQW, 1996a,b)
- City University of Hong Kong Strategic Plan for 1997-2002 (CityU, 1997)

These reports are contextually related and their recommendations will have implementation impact in 1997 and into the next century. The socio-political context is that of Hong Kong, as a colonial territory, returning to China in 1997. The context for higher education is the English system constructed round the three year honours degree and the vocational higher diploma (for example). England and Hong Kong have a three year honours degree. China has a four year honours degree - also, for example, Australia, Scotland and the USA. It is predicted that the four year honours degree (or its credit equivalent) will become the accepted international norm.

Internationally, more and more countries are adopting national (vocational) qualification frameworks. In Europe, EU legislation references UK National Vocational Qualifications for diploma definition. National professional bodies are agreeing to recognise each other's professional qualifications where these require higher education qualifications. Such policies incorporate frameworks, definitions and standards - usually defined (inadequately) in terms of entry level and length (years) of a qualification. Then there is the "obsession with the issue of quality" (Ball, 1996) which, we are told frequently, we cannot define!

'Higher Education in Hong Kong' (UGC, 1996)

The University Grants Committee (UGC), on behalf of Government, has funding and policy responsibilities for higher education in Hong Kong. The UGC notes that their Report started formally with wide consultation regarding an Interim Report (UGC, 1994). The 1996 Report is the outcome of a "gargantuan" task which addresses the "whole of higher education" including the work of the Vocational Training Council (VTC). Accordingly the Report deals with 'sub-degree courses' (e.g. higher diploma) with the nomenclature described as "perhaps unfortunate: these courses are not inferior versions of degree courses". This is a key issue and will be discussed further in the full paper.

'Strategic and Organisational Review of the Vocational Training Council' (SQW, 1996a, b)

The VTC was established in 1982. Changes recommended in the Report are noted as being "long overdue" on the basis of "compelling evidence that VTC has not responded sufficiently to ongoing changes in Hong Kong's economy". The Report offers the "firm conclusion that in many ways VTC is not currently an efficient organisation". The implications are discussed further in regard to other comments such as VTC not offering "qualifications which are highly regarded" (SQW, 1996: 2.34). This is discussed further.

'Strategic Plan for 1997-2002' (CityU, 1996)
City University of Hong Kong - College of Higher Vocational Studies

CityU's Strategic Plan for 1998-2002, makes it quite clear that the College will continue to be an integral part of the University. In effect, the College is a vocational Faculty and is responsible for about 36% of CityU's total population of 13,000 full time equivalent or 18,000 students. CityU is committed to introducing a credit unit system and the Plan notes that such a system should provide opportunity to increase linkage between the

College and the Faculties (there is none); also that "we should aim to open our own degree programmes to qualified College graduates" (CityU, 1997:17). This articulation issue is discussed in regard to overlap concepts of education/training; academic/vocational/professional; and key/transferable/specific skills.

Labour Market Considerations

For higher vocational qualifications, a discussion of labour market considerations in Hong Kong has been provided by Imrie (1995b). A recent example will make the point about supply and demand compounded by oversupply of graduates resulting in "graduate substitution" (UGC, 1996). These considerations will be discussed further.

Professional, Vocational and Academic Qualifications

Fully professional qualifications require at least an honours degree, i.e. an academic qualification. Thus there is overlap. At the undergraduate and postgraduate degree level, it is customary to talk about academic qualifications in 'vocational' fields such as engineering, medicine, law, accountancy, psychology, and teaching (but not for university teachers - too academic perhaps?). The honours degree is considered to represent a standard of intellectual capability (comprising capacity and ability).

In Europe, as noted by the EU Directives, professional qualifications have priority for comparability since such qualifications provide the operational nexus for credentials and performance standards (quality) in the commerce of nations. Internationally, for example, the Washington Accord is an agreement between various autonomous national authorities that professionally accredit university degrees in engineering and recognise each other's accreditation. The signatories represent Australia, Canada, Hong Kong, Ireland, New Zealand, South Africa, UK, and the USA. But what is the relationship between a 'vocational' degree and the higher diploma? In the UK, Nicholson (1996) recognises "the need to weld together academic and vocational routes and qualifications more strongly to provide a curriculum that allows more people to achieve". This is discussed further.

Pedagogical considerations should be addressed through qualification frameworks with outcome levels related to appropriate taxonomies (Imrie, 1995a) developed for the local context i.e. fitness for purpose (Ball, 1985). Issues of capability are addressed in regard to generic, specific and optional (citizen) competencies: criterion-referenced and without the compensations (HEQC, 1995) of norm-referenced degree assessment. As noted previously, the concept of a 'year of study' would be represented in terms of outcomes rather than time thus providing the flexibility for lifelong learning or, more appropriately, continuing professional education.

Europe and Beyond

The Council of the European Communities has published Directives for the recognition of professional education and training, which have the force of legislation. In summary (Imrie, 1996e), the First Diploma Directive (December 1988) is aimed at the recognition of diplomas for professional purposes. The Second Diploma Directive (June 1992) is intended to complement the first and includes in the definition of 'diploma', qualifications accredited as NVQs (or SVQs) at Levels 3 and 4 of the UK National Framework of Vocational Qualifications. The Mutual Recognition Directives relate to the recognition of 'regulated education and training'; they apply to 17 European countries.

For professional purposes (which take priority over academic purposes), the (UK) Engineering Council (1995), for example, sees the standards set by NVQs as the benchmarks for determining its requirements. The Council proposes a single national credit framework for all engineering-related education, whether in school, further education, higher education or work. NVQs are not higher education qualifications; in a discussion of vocational qualifications and standards (HEQC, 1995), it is noted that they are "designed to accredit occupational competence".

Outside Europe, countries such as Australia, New Zealand and South Africa, have introduced qualification frameworks that are more comprehensive than NVQs. For example, the Australian Qualifications Framework (AQF, 1995) makes provision for all qualifications in post-compulsory education and training. There are twelve levels/titles with the top seven in the higher education sector: Doctoral Degree; Masters Degree; Graduate Diploma; Graduate Certificate; Bachelor Degree; Advanced Diploma; Diploma. The latter two provide overlap with the vocational education and training sector thus linking vocational and academic qualifications.

Another example comes from the Canadian Technology Human Resources Board which maintains national standards with one of the purposes being "to promote recognition of qualifications". A national standard is defined as "A description of the competencies expected of technologists at the point of entry to the labour market. It comprises a baseline of generic and discipline-specific knowledge and skills" (CTHRB, 1994).

Concluding Comments

For higher vocational qualifications awarded by higher education institutions (HEIs) such as the higher diploma, there is significant overlap with the honours degree in the relevant, significant knowledge, skill and attitude domains. This reflects the plurality of purposes now represented by current developments of higher education to meet the needs of wider and recurring access. HEIs can no longer be intellectually elitist or preoccupied with the full-time honours degree. Social perceptions, nationally and internationally, indicate that the higher diploma will be more acceptable if renamed as an 'Associate Degree' while retaining the vocational emphasis of preparation for the workplace. The honours degree curriculum needs to 'overlap' in this regard.

It is predicted that the international benchmark for the honours degree will be the four year degree based on a credit (transfer) system that will specify level in terms of learning outcome with learning representing the education/training spectrum (not dichotomy). Accordingly, it will be more generally accepted that, in cognate areas, the associate degree will be articulated with the honours degree on a 2+2 or 50% basis and that this will also be the international standard for professional bodies. Credit systems will provide for national and international flexibility in regard to credit accumulation, transfer, and recognition of prior learning/experience.

Although independent national and international conferences address these issues, effective policy will require governmental initiatives to bring together enthusiastic stakeholders and forge a joint commitment to doing better with the promotion of higher vocational qualifications to meet the social and economic needs of generations to come. In our different countries, I believe that IVETA has the potential to make submissions to influence the future of higher vocational qualifications. Lifelong employability, capability and personal wellbeing are justifiable goals for our future communities and international cooperation.

Approaches to Improving the Senior-Vocational-School Textbooks Review-and-Approval Process in Taiwan

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Abstract

In Taiwan, curriculum standards for senior-vocational schools are determined and promulgated by the Ministry of Education (MOE). Edited on the basis of the curriculum standard, every senior-vocational-school textbook must pass the review-and-approval process conducted by the National Institute of Compilation and Translation, MOE. In order to improve the review-and-approval process, the author conducted a questionnaire survey to gather main stockholders' (publishers, authors and reviewers) opinions on the process. The purposes of this paper are: (1) to describe the current review-and-approval process, (2) to brief main stockholders' opinions on the review-and-approval process, and (3) to suggest approaches to improving the review-and-approval process.

Background

In recent years, calls for educational reform movement have been skyrocketed. School textbooks occupy a highly visible position in these calls for reform. As part of an educative process, textbooks have assumed a main instructional material in Taiwan. In this country, senior-vocational-school textbooks, must be edited and reviewed on the basis of the curriculum standard, which are determined and promulgated by the Ministry of Education (MOE). The National Institute for Compilation and Translation, MOE has managed the review-and-approval process. In order to improve the review-and-approval process, the author conducted a questionnaire survey to gather main stockholders' (publishers, authors, reviewers) opinions on the process. The purposes of this paper are: (1) to describe the current review-and-approval process, (2) to brief main stockholders' opinions on the review-and-approval process and (3) to suggest approaches to improving the review-and-approval process. Because the questionnaire survey will not be completed by the end of June, 1997, the methodology and results of the study leading to this paper will be presented in detail in a finalized presentation paper.

Education Resource Centers: A New Approach to the Professional Development of Educators in the Republic of Türkiye (Turkey)

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Abstract

This paper reports on the planning and designing of Education Resource Centers (ERCs) in the Republic of Türkiye (Turkey). The mission of the ERCs is to improve performance of professional education personnel by providing training and other education services that could not be met by existing in-service programs. Education Resource Centers represent one component of an agreement between the World Bank and the Republic of Türkiye to improve primary and secondary education through a National Education Development Project.

The author and a Turkish consultant collaborated with representatives of the Ministry of National Education (MONE) to select locations, design, and plan four pilot ERCs. The ERCs were to assist with selected aspects of professional development activities for teachers, counselors, administrators, and other professional education personnel. ERCs would provide an operational linkage between the central MONE administration and the provinces.

Functions of ERCs include: (1) curriculum development; (2) school-based research; (3) needs assessments, (4) instructional materials depository; (5) post-graduate certificate; (6) distance education; (7) foreign language training; and (8) special purpose programs.

Introduction

The original idea of a teachers' center was to operate single-subject centers for mathematics or science teachers where they could meet in groups to discuss curriculum problems. Pilot schools were identified and various special projects teams, sometimes consisting of as many as 100 teachers, would be formed to develop specific subject areas. One individual responsible for each center would coordinate each curriculum project and ensure a flow of constructive criticism of teacher-prepared curriculum materials and teachers' guides. However, administrators and teachers alike soon realized the residual benefits of teachers' centers. The exchange of ideas was stimulating, and the range of activities went beyond curriculum development.

Education resource centers for professional education personnel, especially teachers, are growing rapidly throughout the world. Such centers have made significant contributions to curriculum and professional development by providing an opportunity for teachers to share their ideas, prepare their own instructional materials, and participate in the research process. In addition, teachers can learn new skills and knowledge through specially designed courses. Increasingly, education resource centers are becoming an integral part of the education system of a country.

Purpose

The purpose of Education Resource Centers (ERCs) is to improve student performance and enhance student outcomes through professional development of teachers, principals, counselors, school inspectors, and other professional education personnel. Education resources and specialized education programs are provided to professional staff to support ERC functions and to deliver services.

The ERCs could expand and strengthen existing in-service and special purpose programs for various groups of education personnel. These Centers would (a) serve as special facilities for selected education activities, such as preparation of in-service teacher trainers, school inspectors, and provincial directorate staff, (b) assist in curriculum and instructional materials dissemination, implementation, and evaluation, (c) serve as regional depositories of resource materials which teachers can use independently of organized training programs, and (d) assist the Education Research and Development Directorate of the Ministry of National Education (MONE) and universities in school-based research.

Significance

The MONE requires that teachers complete at least one refresher course every five years. The In-service Training Department of the MONE conducted 434 courses for 100,393 teachers during the 1991-1992 school year. However, there were nearly 420,000 teachers in the public schools in Türkiye that year. These data suggest that less than 25 percent of the country's teachers participated in a formal in-service course. The total number of teachers in public schools during the 1992-1993 school year was more than 482,000. Those teachers served more than 13 million school age youth. It is estimated that the number of teachers will need to increase by approximately 10 percent per year due to the rapid increase in school age children. By the 1993-1994 school year there were approximately 14 million students and more than 500,000 teachers. Each ERC would be utilized for 48 weeks per year, which on the basis of a projected two-weeks course, would give each ERC a projected loading of 24 courses of two weeks duration per year. Each course would serve approximately 250 teachers, for a combined approximate total of 6,000 teachers per year per Center.

Conceptual/Philosophical/Practical Basis

Enhanced professionalism and a desire by professional education personnel to improve their performance and effectiveness by building on existing technical, professional, and/or personal skills and/or developing new skills, results in an increase in specialization. Access to and utilization of curriculum and instructional materials, media products, and technical and professional publications are vital to improving the professional skills, knowledge, and attitudes that teachers and counselors can transfer to their respective students.

One of the primary objectives of the MONE was to improve elementary and secondary education by providing in-service training programs for an additional 57,000 teachers per year. The ERCs could serve up to 24,000 teachers per year and the remaining 33,000 would be served through existing in-service programs and distance education.

Due to the growth in education professions and technology, the large numbers of teachers, counselors and administrators in post to receive in-service education, and the turnover of teachers, the need for continuous services to improve teacher and administrator performance was recognized. The ERCs were designed as multi-purpose provincial extensions of the MONE operating under the auspices of the In-Service Education Department. Each ERC could serve more than one province. ERCs will provide resources and training on a continuous basis.

Methods and Procedures

The author as an expatriate consultant, worked closely with a Turkish consultant, personnel representing the MONE, particularly individuals within the In-Service Education Department, and representatives of the World Bank to carry out the terms of agreement between the Republic of Türkiye, MONE and the World Bank. Sites for four pilot ERCs were identified in geographical locations with large numbers of teachers. The ERCs would be governed by the MONE and operate under the auspices of the In-service Training Department, thereby providing an operational linkage between the Central Administration and the Provinces.

A pilot site was identified in each of the following provinces: (1) Mersin-Içel, (2) Aksaray, (3) Ankara, and (4) Izmir. Each ERC, except for the one in Izmir, was located in an existing and fully operational provincial in-service training institute. The Izmir site is a former school for deaf and hearing impaired children. This site was undergoing renovation for an ERC to accommodate professional development needs of special education teachers in Türkiye.

The provincial in-service training institutes are government-owned physical facilities where the MONE sponsors and conducts various seminars, workshops, and short courses for teachers, administrators, school inspectors, and other professional education personnel. The in-service training institutes were important to the development of ERCs because ERCs require permanent facilities and adequate space to conduct their functions on an on-going basis. In addition, two of the existing in-service facilities can provide meals and lodging for participants.

Functions of Education Resource Centers

1. Serve as depositories (instructional materials rooms) for teacher resource materials which teachers can use independently of organized programs.

2. Assist departments within the MONE such as the Education Research and Development Department and universities in school-based research. ERC personnel will schedule facilities and other resources for professional personnel to conduct research and share results.

3. Provide materials, equipment and other assistance on a continuous basis to university faculty members to conduct in-service courses.

4. Serve as an extension campus for universities to provide a planned sequence of on-going residential courses for qualified professional educa-

tion personnel. After a participant successfully completes a designated series of courses, a certificate would be granted from the university providing the training.

5. Establish a foreign language training program to teach basic skills and to upgrade the skills of existing foreign language teachers.

6. Secure, catalog, house, maintain, and disseminate print and non-print resources and equipment to support distance education programs provided by the Film, Radio and Television Education Directorate of the MONE.

7. Conduct special purpose training related to effective use of ERC services.

Conclusions and Recommendations

The ERCs should interface within and outside their organizational structure as appropriate to help achieve the mission and carry out the multiple functions. Process-oriented functions such as special purpose training, seminars, and workshops; curriculum and instructional materials dissemination, implementation, and evaluation; continuous acquisition and distribution of teacher and administrator resources; and on-going research are best accomplished with a team approach. For example, interaction with the Radio and Television Directorate, the Laboratory School Section and the Curriculum and Textbook Section of the Directorate of Education Research and Development, and other appropriate departments within the MONE is necessary to foster a team approach.

In addition, staffing needs and staffing patterns for the ERCs should be based on the services to be offered. Sample responsibilities that ERC personnel may be expected to perform include (1) securing, organizing, maintaining, and disseminating instructional materials, tools, equipment, and supplies, (2) collaborating with other professional education personnel to share human and other resources, (3) conducting education programs and research and curriculum projects, (4) training teachers to utilize the products and services of the ERCs, and (5) providing facilities and equipment for distance learning.

United States National Family and Consumer Sciences Standards Project

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Abstract

This is a significant step for Family and Consumer Sciences, formerly Home Economics, to move to update and consolidate the 50 state sets of standards, each developed in concert with business and industry, stakeholders in their states, and community groups.

Content

The Family and Consumer Sciences National Standards address content/cluster and core areas:

> Hospitality; Food Production and Service; Food Sciences and Dietetics; Early Childhood, Family, and Community Services; Apparel and Textiles; Management, Maintenance, and Design of Interiors; and Consumer Resources Management.

Academic and occupational skills were cross-referenced to address balancing work and family and employment skills.

Format

The format is significantly different from those used by other skill standards in the United States, in that it brings together competencies and higher order thinking/reasoning processes. In addition, related academic state-

ments are identified for each standard. Authentic scenarios are being built to assist in the instruction and assessment phases. A formula for the development and use of scenarios in the classroom will be provided.

The Validated V-TECS Related Academic Taxonomy and a newly developed Higher Order Thinking Skills Taxonomy (HOTS) were used to achieve reliability. These taxonomies provide a common language for academic and occupational instructors to work together to establish an inclusive curriculum.

Processes

The significance of this project is the method of involvement of all stakeholders from business and industry, government, education, and the community in the process so that they will endorse and accept these standards.

The constructs involved in the development of the standards, such as the Related Academic Taxonomy are now being recognized in the United States for the value in linking academics with vocational-occupational content. Other processes established during this project will also help inform the standards development in United States, including how to make successful linkages between academics and occupational fields and linkage of higher order thinking/reasoning skills with competencies, using scenarios.

The Philosophical and Practical Bases for the Development

The bases for the research and development for this project come from the need in America to address the problem of assisting both youth and adults into career pathways that lead to occupational fields where large numbers of jobs exist and where opportunities exist for expansion and growth. What makes this project unique from others in vocational education is its inclusion of the aspects of balancing work and life skills. Employers in America are recognizing this as a factor in productivity. Over one half of the workers in the United States workforce are women. In addition, during the past year, the United States Congress passed legislation that signalled the end of Welfare, a program that mostly serves single parents (mostly women) and children. Individuals will have two years to prepare for work and be off welfare. This brings a tremendous need for the vocational-technical education system to establish national programs to be offered in all states to address numbers of issues including: a) Balancing Work and Family Issues, b) Developing Occupational Skills to Sustain a Family with Career Ladders, and c) Utilizing Current Skills as a Base to Build Skills For the Workforce.

Since over three million students are now enrolled in Family and Consumer Sciences programs in the secondary school level, it become apparent that these programs would have to reflect a new perspective to raise standards, ones that are at a national level and hold value to the learner and to the employer. In addition, some three million women on welfare need work skills and balancing life skills to be successful off welfare. They may possess the basic skills in child care and food production to start toward occupational skills in these areas. Therefore, the climate in the United States is demanding these Standards be established.

Methods and Procedures for the Project

The Family and Consumer Sciences Education program as part of American Vocational Education fields, has addressed workforce skills and issues of families and work since 1918. Since the 1960's, it has steadily added specific workforce skills to the curriculum programs related to food services, hospitality, child care and care of the elderly, clothing services, and interior furnishing, and human service management. However, each state developed independent standards, based on independent philosophies and the needs of businesses in their states.

During this past year, the State Administrators for Family and Consumer Sciences Education determined they would work together with the U.S. Departments of Education and Labor, business, and community groups to address National Standards. The project was awarded to the Vocational-Technical Education Consortium of States(V-TECS). The design is as follows:

A. Redefining of occupational content and clusters; redefining of core competencies.
B. Design of the development, validation and promotion, and implementation stages.
C. Pilots and Innovative Projects.

The Project was designed to be accomplished in Five Stages including:

Stage I--Research, Collection and Analysis of Data. The research base incorporates various state philosophical bases of occupational specific skills to the problem solving/critical thinking model. It incorporated an analysis of various trade association standards, such as the National Restaurant Association, the American Hotel & Motel Association, and American Federation of Chefs, Apprenticeship Program, and the Child Development Associate Program, as well as those developed by states with business.

Stage II--Development. Committees are established for Clusters/Content Areas and Core. Input is first being sought from focus sessions across the United States that will be used with the research base by the Development Panels to establish a draft set of standards for each area and core. Development Panels membership includes business representatives, content specialists, and others. The focus sessions involve workers performing the related tasks and skills.

Stage III--Further Development and Validation. The Assembly of States is being held with teams of State Departments of Education, stakeholders and practitioners representing each state. Validation involves business and industry, content specialists, and others. Input from these teams will be reviewed by Development Panels.

Stage IV--Verification--Survey by Mail. The survey addresses individuals from business and industry, content specialists, and others. Various levels of business are reviewing the standards, to ensure that differences do not exist in what are management desires and work actually performed. Policy makers are being asked to input on national policies that may be affected by changes in standards and requirements.

Stage V--Implementation Strategies. Meetings are set for at least 20 sites for large group sessions on the New National Standards. These sessions will begin implementation strategies, review pilot and innovative project results. Strategies will be determined for implementation and partnerships at state and local levels enhanced and supported for further pilots and innovative programs using the standards.

In addition, a National Advisory Council has been formed to include high level members of the U.S. Department of Education, Labor, Congress, business and industry, policy interest groups, foundations interested in youth, children, families, workforce, and education issues.

Implementation Pilots

The Arizona School-to-Work System, through Tech Prep, has developed a pilot with the National Restaurant Association and the American Hotel & Motel Association to implement National Standards for the Food Production and Service Cluster. Components include:

- Working with the Arizona and National Restaurant Association (NRA), Arizona and American Hotel & Motel Association, Arizona Department of Education, Arizona State Board of Directors of Community Colleges and secondary and community colleges offering Hospitality and Food Production/Culinary Arts programs.

- Provide workshops for instructors on Pro-Start and Pro Management (NRA) Curriculum.
- Provide workshops for family and consumer sciences, business, and foreign language instructors on the American Hotel & Motel Association training modules and standards involved in international guest services and cultural diversity; safety and security, and simulation on the front desk operation.

The programs will be offered as a series throughout next year, with evaluation components to be used to determine how standards were implemented and what lessons may be learned and used in the future in-service programs in other states. Presentations will be made at the American Vocational Association and the Family and Consumer Sciences Administrators meetings.

Findings and Conclusions

National Family and Consumer Sciences Standards Processes and Implementation Strategies have value for the United States in motivating a future workforce to aspire to higher standards in work and in family and individual living. The National Standards are bringing greater cohesiveness between the education and the employer communities. The development of National Standards has enabled large numbers of individuals to embrace and accept these standards before they were finalized through consensus processes used, thus eliminating part of the difficulty in implementation that other sets of standards have had. Since the project is not yet completed, not all conclusions are available.

Implications and Recommendations

When developing National Skill Standards consider a variety of methods and processes that may enhance the "buy in" through the involvement during development and validation stages.

Consider the expansion of Specific Skill Standards to include the balancing of work and living skills. Businesses today are faced with lowered productivity due to the number of individuals in the workforce today with major family responsibilities.

Consider implementation strategies including pilots and innovative programs to be coupled with the development of standards to move from Standards establishment to real implementation.

Consider the use of strong, powerful advisory council to move overall issues, provide resources for implementation, and provide promotion to employers and others.

Materials to be Shared in Cumulative Activities

- A template for developing scenarios utilizing higher order thinking/reasoning skills, occupational competencies, and related academic competencies.
- Template for use of the V-TECS Related Academic and Higher Order Thinking/Reasoning Skills (HOTS).
- Report on Arizona Pilot related to use of U.S. National Restaurant Association Standards and the American Hotel Motel Association Standards.

Vocational and Technical Education Projects in Türkiye

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Abstract

The aim of this article is to provide information on the organization operation and projects of formal and non formal vocational and technical education programs in the Republic of Turkiye. After the short introduction and information about Turkiye, the structure of the National Education System of Turkiye and the projects supported by World Bank will be presented. The total amount of financial support supplied for the development of the Vocational and Technical Education for these projects are approximately 342 million dollar. The purpose of all these projects is to increase the quality of the education and to provide more qualified man power to industry. In the conclusion, the evaluation of the projects is presented and the deficient parts of the education system is discussed, and possible solution proposals are presented.

1. Introduction

The purpose of this article is to provide information on the organization operations, development, projects, problems and solution offers of Vocational and Technical Education (High school and higher education) in the Republic of Türkiye (Turkey). Although lagging behind most western European Countries, the Republic of Turkey is a rapidly developing nation looking forward to increased industrialization, participation in international markets and European Union and a brighter future.

2. Background Information about Türkiye

Some background information about Republic of Türkiye help to put the country's education and training needs in perspective. First, Türkiye has a strong desire to improve its ability to compete internationally and to gain full membership in the European Union (EU) its geographic location is ideal for full EC participation.

3. General Structure of Turkish National Education System

The basic structure of the National Education system is outlined by the Basic Law. The educational system is divided into two main sections as formal and non-formal education (8).

3.1 Formal Education

Pre-school education, primary education, secondary education and higher education is included in formal education.

Pre-school Education: Pre-school education is for the education of children at the age of 4-5. The aims of pre-school education, which is optional, are to develop the physical, mental and emotional abilities of children; to help them acquire good habits; to prepare them for basic education and to help them improve their Turkish language skills.

Primary Education: Primary education consists of 5-year primary school and 3-year middle school for 6-14 aged children. Primary school is based on the National Education System. 5-year primary school is compulsory for all Turkish citizens.

Secondary Education: Secondary education includes all types of the high schools which provide education and training for at least three years in academic, vocational and technical fields.

Higher Education: Higher education includes all educational programmes of at least two years and over. The aim of higher education is to offer education to individuals to meet the demands of the society at various higher levels and to develop scientific research for Turkey to be a part of the developed countries, by preparing a suitable research environment. Higher education comprises universities, faculties, institutions, two-year Colleges and research centres.

3.2 Non-formal and Apprenticeship Education and Training

Non-formal education includes guidance and training activities for individuals who are out of formal education or at any level of formal education. It is given for them to gain the basic knowledge and skills.

Non-formal education and training is provided through short and long-term courses where programmes are developed and implemented based on the local demands and needs.

4. Technical and Vocational Education Projects

In Türkiye, from 1984 up to now, important projects have been performed. These projects were supported by World Bank and Turkish Government. One of them is for Two Years College, Two of them are for developing the Technical and Vocational High Schools and Non Formal Education.

General information about related projects are as follows.

4.1. YÖK (Higher Education Council)/World Bank Industrial Education Project

In 1984 a project funded by the World Bank under the direction of the Higher Education Council (YÖK) was established to develop Higher Technician (Tekniker) training at 8 Two Year Colleges (TYC) throughout Turkiye and a further 22 TYC's and 4 Technical and Vocational Educational Faculties were added in 1988. Curricula for 21 technical programmes were prepared at that time and these programmes were introduced in to the TYCs over period of years. Under the same project, workshop and laboratory equipment was provided to support these programmes.

197.8 m. US dollars have been spent for these projects 101 m. US $ was spent for laboratory and workshop equipment and the rest of the money was spend for instructor training, consultancy and other expenditures. It started in 1984 and will finish at the and of 1997.

Through the project 657 instructors were trained in USA and England. for the durations of 9, 7, or 3 months periods.

4.2 The Project of Industrial Schools

These project covers Technical and Vocational High Schools (Formal) (7).

The aim of the project to develop technical and vocational high school education.

Some information about projects are as follows.

Contract date : 29 th July 1985 Total Cost of Project: m $ 72.7

Start of Project : 8th July 1985 End of Project: 31st December 1994

About 70% of money was spent for laboratory and workshops equipment and rest of it for book translation, teacher training, consultancy and other expenditures.

Through the project, 39 Technical and Vocational School were equipped. 278 teachers were trained in USA, England, Germany, Ireland, Italy and Switzerland.

The developed programs covered by this project are electronic, printing, textile, Air Conditioning and Refrigeration, CNC Technology, Telecommunication etc.

4.3 The Project of Non-Formal Education

This project covers Adult Technical Training and Apprenticeship Training Programs.

The main aim of the project to develop the non-formal education. Some information about projects are as follows.

Contract date : 12th Jan. 1987	Total cost of project: m. $ 71.1
Start of Project: 21st March. 1987	End of Project: 31st Dec. 1995

51.8 million US Dollar of this amount was spent for laboratory and workshop equipments and 19.3 million US Dollar of this amount was spent for training, consultancy and other expenditures.

Through the project, 293 centers were equipped and about 85.000 persons were trained by 1997.

187 teacher were trained in USA, England and Ireland.

32 books were translated to Turkish. The programs covered by this project are computer, Electronics, Education Management, Developing Educational Materials, Refrigeration-Air Conditioning etc.

6. Conclusion

Türkiye is a country which has large number of young generation and developing very rapidly. Providing that Türkiye trains its young generation very well, it will be a developed country in the 21st century. There is an important place for TYC's to train this young generation. To solve mentioned problems above Turkey should have relationship with the countries which have more experiences than Turkey and Turkish colleges have to have good relationship with developed colleges in Europe, U.S.A. and other countries.

TYC should give diploma and certificate over 20-30 thousand people by its 100-200 programmes. All TYC should have open education centre and continuously education centre. And there should be a centre to coordinate all the TYC's which controls the standard of education among TYC's and open new programmes as Turkish industry's need.

Turkey continues to develop close and collaborative relationships among state and private business and industry organizations to assure value and relevancy in its manpower development efforts. Work is underway to ensure the compatibility of curricula used in non-formal education programs with advancing technologies and industry needs. At the same time, the MONE is dedicated to revising its salary scale to attract qualified professionals. More important, the Republic of Turkey is increasing its efforts to establish a sound economic base through development of its human resources in the MONE's projects.

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PART V

NETWORKS AS RESOURCES FOR VOCATIONAL EDUCATION AND TRAINING

International Networks as Resources for Vocational Education and Training

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Introduction and Purpose

Vocational education and training organizations, institutions and systems world-wide constantly seek to enrich and expand their base of resources. They aspire also to improve access to their programs, to strengthen quality and to compete effectively in the global marketplace.

The purposes of this paper, and presentation, are to clarify, and emphasize, the crucial roles that networks -- and networking -- play in connecting needed resources to institutions, organizations and systems. As our world grows smaller in time and distance, many of the resources our programs require become more easily identified. At the same time, competition for these resources becomes more pervasive and intense. Vocational education and training entities must identify and learn how to incorporate into their business routines and systems the resources that can be accessed through the great scope and variety of networks and networked systems that exist in our rapidly changing and time-shrunk world.

The essential resources we require can be classified in five categories. In this paper, these five fundamental resources will be discussed, as will the networks that enable us to capture and utilize them to improve access to and quality of vocational education and training.

The Essential Resources for Vocational Education and Training

Regardless of how we acquire them, the resources needed for any undertaking can be found in one of only five categories: *time, money, physical/natural, information* and *people*. Each contributes essential elements to the whole of any enterprise whether the intended result is a product or a service. Each will be reviewed in the contexts of its implications for the development and implementation of high quality, accessible, productive and cost effective vocational education and training programs and with respect to international networks.

Time

Easily the most elusive and difficult to manage of the five essential resources, *time* is the only one that is not renewable. The human tendency to value time dates to earliest history. We value time, measure it, and use it as a measure. Of the five resources available to us, we most often use time as an excuse for inadequate accomplishment. We either react or respond to time lines. We are honoured if we meet them and penalized if we do not.

The best we can hope to accomplish with this resources is to learn to use it as efficiently and effectively as we can. Investments in training faculty and staff in the effective management of their time are known to be worthwhile. Planned use of time pays important dividends to both individuals and organizations. The time spent in developing improved skills and systems for the management of this elusive resource will be well spent. Time can not be renewed. Once used, it is gone – forever and all time.

Time as a factor in our access and use of networks requires that we consistently take into account the time differences caused by our geographic location from one another. However, with the increasing use of easily accessible and low cost technology for communication, distance and location elements will become increasingly less critical in the larger scope of our international work.

Money

Often the first resource mentioned as essential to any enterprise is *money*, or capital. It is important to keep in mind that money has one primary purpose as a resource and that is to *assign value* to the other four resources. Without a fiscal measuring scale of some type, we would not be able to determine the value of the time, information, physical/natural, or human resources with which we must work. Thus, money might be seen as an enabling resource - one that imparts measurable values to other resources in order that we can determine the extent of our need for them.

In the context of international networks as resources for vocational education and training, monetary values are assigned to each of the resources we access through those networks. Whether the captured resource is information, or a specialized consultant, or a piece of needed software, we use money to declare some value for that resource. And, we may use physical resources, such as the Internet (which has monetary value) as the vehicle through which we identify and access the information or human resources we need.

Physical/Natural

Often taken for granted are the physical and natural resources we use in carrying out our work. For vocational technical educators, physical resources include the tools, equipment, buildings, and their related support systems. For some of our programs, particularly those dealing with the natural environment such as water treatment or air quality management, the resources themselves become the subject of the instruction. In short, this class of resources, the *physical and natural*, are essential to our work. They are the hardware, the software, the tools of our education and training trade.

As we seek access to these resources through our various networks, we need to keep in mind the fragile nature of the natural resources, the upkeep and maintenance required by the physical resources, and the extent to which we make investments for the renewal of both. Not all are wholly renewable. We must use our skills as managers and teachers, and our varied networks to maintain their quality and utility.

Information

The most under-utilized of the five resources is *information*. The very future of our vocational education and training enterprise depends on how well we learn to use this nearly limitless resource. The continuing growth of knowledge, (all knowledge doubles every two years - or less!) and the increasing use of technology to acquire the information that the explosion of knowledge produces, presents special and growing challenges to our profession. New generations of computers; world-wide communication via two-way television; the rapidly expanding capacity and speed of the Internet; exponential growth in distance learning systems world-wide; these are but a few of the indicators of the essential role this resource will continue to play in the business of educating and training the world's workforce.

Information is the essence of networking. It is the primary reason we establish and use networks; networks of people, organizations, systems; networks of computers, television, radio. Our appetites for information are insatiable. Networks provide the connections we need to acquire the information we need to feed our intellectual and organizational appetites.

People

The fifth and most important of the five essential resources is *people*. Of the five, the human being is the only one that is truly and wholly renewable. Because people *are* our most renewable resource, it becomes our responsibility to assure their renewal. Nothing could be more important for a professional organization such as IVETA than its focus on the professional growth and development of its members. And, we must use each of the other four resources to ensure that the human resource development efforts we undertake are of the highest quality and are accessible to the most people.

After information, people are the most sought resource world wide. People both comprise and use networks. We create networks in order to share or exchange information about the five resources we need – and use – to carry out our respective missions in the vocational education and training enterprises in which we are engaged.

International Networks for Resource Access and Enhancement

International networks provide the contact points and the frameworks for accessing to world's human, information and other resources. Literally hundreds of formal networks exist that focus on international development. Many of those emphasize issues dealing with education and training. New networks are added every day to the World Wide Web. The task we face is selecting those that provide the best and most accurate information in the most timely and cost effective manner.

Some of the most accessible and useful international networks are those that focus on professional growth and development of people who have common interests and goals. The International Vocational Education and Training Association (IVETA) is an appropriate example. IVETA is organized to foster and promote professional linkages among international vocational educators and trainers; to serve as a forum for sharing problems and solutions; to support the continuing development of vocational education and training as an international enterprise; and to facilitate the worldwide dissemination of education and training information. The Association publishes a refereed professional journal, several newsletters annually, and hosts at least one international conference for its members each year. The present conference in Helsinki is one of two international meetings sponsored by IVETA in 1997. The second networking conference will be held in Las Vegas, Nevada, USA, in December, 1997.

The international network provided by organizations such as IVETA are but one example. Another predominant, and expanding, international networking resource is the Internet, which provides much of the world almost immediate access to the widest possible range of information, data and people concerned with international vocational education and training. Through this technology, we are now able to connect to libraries world wide, providing access to the most recent research and development in our field. We can communicate with individuals or groups through electronic mail, thus establishing our own small international networks of persons with highly specialized, common interests.

A few months ago, I asked several colleagues to list the five most important international networks they access on a regular basis. Without exception, they were able to quickly list five (in most cases more) and shared reasons why their international networks are so important to them. Included among those reasons were "they are leaders who are on top of the issues"; "they have access to all schools"; "they are very current and are in contact with their departments of labor..."; and, "because student support and staff development in (these) colleges are both crucial to quality vocational education". These colleagues also reported that the most important resources their networks provide them are "contacts, publications, information about what's happening in the field..."; and "guidelines and standards, model programs, upcoming events information, newsletters, access to conferences, RFP's (requests for proposals for grants), training opportunities." They also indicated their increasing dependence on technology for reaching the resources the networks make available. Electronic mail was highly valued, and considered very useful. And, several continue to depend on the postal services of their countries and the telephone and fax as important means for making connections.

Summary

Perhaps the more important issue regarding international networks as resources for vocational education and training is that of first identifying the resources we need. Which of the five resources – *time, money, physical/natural, information,* or *people* -- is required to address the problem or issue we seek to solve? Once need is clear, we can select the best source with which to connect, with some confidence that we will find answers through the myriad of available international networks.

This conference is an international network in action. It provides us tangible examples of how connections are made, networks constructed and resources acquired. Most important of the resources – each of you, a human resource – are here connecting, networking, and most likely starting new networks. As you return to your home and workplace, take with you a new network connection – the name of a person, an institution, a business – and then make contact. Extend that network. It is your new resource.

Network-Based Flexible Learning: Prospects and Challenges in 21st Century

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Synopsis

Over the past few years, the world has witnessed a phenomenal growth in communication technology, computer network and information technology. All these developments have a profound impact on flexible delivery approaches to technical and vocational education which allow teachers and students to have access to the world beyond the conventional classroom and have the potential to change the nature and process of learning environment.

But in spite of all the enthusiasm with respect to network based learning, in most of the cases one tends to confuse learning with access to information. Much of the literature about network based learning talks about making vast amount of world wide information available to the learner, but often in completely unstructured ways and with no consideration about how to make use of the information. In most of cases, access to information does not lead to learning. This view undermines the challenges and issues to be addressed related to pedagogy and the changing nature of learning process in the network based learning in the 21st century.

Present paper discusses the characteristics of flexible delivery system in the context of vocational education and highlights the requirements of highly interactive multimedia based software which will make learning more individualized, active, enjoyable under the changed environment of network based learning.

1. Introduction

During the past few years, the world witnessed a phenomenal growth in communication technology, computer network and information technology. With the development of new broadband communication services, convergence of telecommunication with computers, recent developments in the field of communication protocol have fostered numerous proposals for the uses of these tools for distance and flexible delivery in the field of technical and vocational education and training. To accommodate variable requirements and needs of the learner, flexible delivery system allows for the use of a range of learning strategies in a variety of learning environments. It provides the flexibility in selecting the content, time, duration, pace, place of study and also strategy for study. The integration of computers and communications offers unprecedented opportunities to the technical and vocational education system with its capacity to integrate and interact with each other over a wide geographic distance in a meaningful way to achieve the instructional objectives. The growth of these communication and computer system, their ease of use, the power and diversity of information transfer allow teachers and students to have access to a world beyond the classroom and have the potential to change the nature and process of the learning environment.

But most of the network based learning package currently available confine themselves to the domain of information transfer. Little interactive courseware is available, except for hyper media jumps. Much enthusiasm tends to confuse learning with access to information. To make the learning more individualized, more active and enjoyable, there is an urgent necessity to develop highly interactive multimedia based software under the change environment of Network Based Learning. It should be always kept in mind that no matter how sophisticated the technology is, it is the individual who decides **when, how, what** and **why** they learn.

2. Flexible Delivery and TVET

The traditional orientation and organization of many technical and vocational education and training (TVET) institutions in the past excludes or discourage people from access to and participation in learning. These situation has thrown up a challenge to all TVET institution to overcome the barriers that have in the past prevented large section of the population to participate in vocational education and training. In order to achieve increased accessibility and flexibility without hampering the quality learning, there is a need to understand the concept of flexible delivery approach for TVET institutions.

Flexible delivery is an approach to vocational education and training which allows for the adoption of a range of learning strategies in a variety of learning environments. A flexible delivery system caters for difference in learning styles and learning needs and provides a range of learning opportunities. It is aimed at increasing access and providing large numbers of learners with greater choice of programmes with flexibility in system of delivery. Flexible delivery is the use of a range of learner oriented strategies which allow training system to became more customer driven and more responsive towards learner needs. It promotes the use of range of delivery nodes and delivery venus to meet the needs of the learners. The whole approach of flexible delivery will benefits the TVET system by removing barriers and impediments to learning and improving the effectiveness and productivity of learning. As a whole TVET system will be beneficial by increasing the enrolment, by providing opportunities to disadvantaged group, by maintaining higher retention rate, by keeping higher success rate. Over and above it will enhance the quality of learning in TVET system.

3. Features of Flexible Delivery System

The characteristics flexible delivery system can be looked from various perspective and which may vary within and between institutions. But some of the features of flexible delivery systems have in common.

3.1 Learner Perspective

There are many issues of the learner that has to be considered while developing flexible learning strategies. The key issues are

3.1.1 Location. The conventional classroom education has a fixed place to learn, whilst many learners still prefer to learn at different places like home, workplace or local training centres. Teachers need to develop flexible ways of providing training in a range of locations to suit learner needs. The requirement of ANYWHERE study of the learning has to be met.

3.1.2 Timing. Conventional classroom teaching implies that education not only takes place at fixed locations, but also at fixed time, when the student and instructor appear together at the same time. But more flexible education in the future might allow learning to take place at ANY point of time. Flexible timing arrangements facilitate training on demand and exit from the course when the competencies have been achieved. Self paced study options are most effective in catering for these timing choices.

3.1.3 Pace. Most education today has a fixed pace. The course starts and stops at the particular moments for all students. But another aspect of the differences between the students is that they do not learn at the same rate. Some of the differences, but not all, come from the fact that students have different backgrounds. Some learners will progress quickly through the course whilst others will need more time to master the competencies. Flexible systems should cater for variation in pace of learning.

3.1.4 Individualized and Interactive. Each learner is a unique individual. Ideal teaching should address individual student's problems to use the learning approach that best matches each student learning style i.e., learning should be individualized. In developing individualized learning materials, two aspects of interaction need attention: one is the frequency of interaction and the other is the learning quality of interaction. Related to this is the necessity for high quality learning to make learning an active process, not the passive activity of lecturing or watching video.

3.2 Flexibility in Curriculum

One of the major challenges in establishing new delivery systems is the need for appropriate curriculum and its supporting resource materials. Traditional curriculum has often been couched in site, equipment or learner specific terms with fixed student teacher ratios and a certain length of study being built into it. Most of these features can serve as inhibitors to the spread of more flexible means of delivery.

Experience has shown the benefits for flexible delivery when the curriculum is designed as competency based and training is available in a modular structure with opportunities for flexibility and choice. Curriculum processes should be designed in such a manner so that it can readily accommodate the needs of the learner and potential of the new technology.

3.3 Resources and Infrastructure

To cope with the flexible delivery system, a strategic shift is needed in concept, design renovation and use of educational facilities. Flexibility, adaptability, appropriate size, configuration, ease of access and capacity for integration are some of the new principles that are emerging on the infrastructural scene. New technologies require new or modified building and different types of equipment. Flexible delivery require wide range of learning resource available to the student who can access it at the time, place and pace that suits their learning style. It has been observed that flexible delivery system based on interactivity has produce better quality outcomes than the non interactive technology.

4. Flexible Delivery System and Communication Technology

Computer network and communication technology have provided enormous opportunities to implement the characteristics of flexible delivery system in teaching - learning environment. Continuing innovations in technology have the capacity to transform the TVET system and generate different models of service delivery. It can cater to different teaching - learning structures for implementation of flexible delivery approach. If we consider the time and location quadrant in the delivery of technical and vocational education and training (TVET), it provides an interesting framework within which we can assess the application of communication technology in TVET system. The model describes the issues on time and place related to the teachers and the students with the model assuring that the teachers are located at the institution.

Table 1. *The Time and Location Quadrant in the Delivery of TVET*

	SAME TIME	DIFFERENT TIME
SAME PLACE	Face to face lectures Classroom sessions Tutorial, Laboratory sessions Demonstrations	Flexi-mode, Self-paced learning on campus Computer based learning Bulletin Board service Multimedia packages, Networking
DIFFERENT PLACE	Audio conferencing Video conferencing Audiographics, Interactive computer programmes Networking, Bulletin Board service, Broadcast TV, Radio	Distance education Correspondence and external studies CD Rom packages Bulletin Board delivery Bulletin Board forums, Broadcast TV Radio

Emerging broadband communication technology has the potential to impact on education and training to permit various forms of interactive virtual learning environments and to provide remote presence. So it is not only the question of time and location, but the interactive individualized learning which matter most.

The experience of network based learning would indicate that the delivery models which are not interactive are, generally speaking, less effective than those which are. The advent of world wide web, the internet has opened up enormous opportunities to the learner by providing one to one, self paced learning style appropriate instructions in different time and different place.

5. Challenges Ahead

But in spite of all the enthusiasm with respect to network based learning, in most of the cases one tends to confuse learning with access to information. Much of the literature about network based flexible learning talks about making vast amounts of world wide information through internet, world wide web available to the learner, but often in completely unstructured ways with no consideration about how to make use of the information. For many learners, student access to information does not lead to learning. Nothing is intrinsically wrong with providing access to data and providing hyper media documents in information high way. It is a question of confusing this with learning or ignoring learning. So the question arises, how does one achieve a higher quality of learning? Two factors, viz., the ability to make learning active for all learners and the ability to individualize the learning process, are critical in improving the quality of learning for learners.

In both counts, present day network based learning has opened up a new challenge to the education. To make full potential of what is possible with network based learning, the need of the hour is to create highly interactive individualized learning materials with full multimedia capabilities, which will make learning more active and enjoyable under the changed environment of network based learning.

We need to produce large amounts of interactive multimedia software to utilize full implications of the internet, the world wide web and other global communication system for learning purpose in the 21st Century. This will contribute a long way to flexible delivery system of technical vocational education and training.

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The Need for Strategic Alliances-Networks in VET

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Starting-points

- Learning (education and training) is fundamental to the well-being of our society. It enables:
  - individuals to achieve fulfilment,
  - communities to function,
  - companies to operate and compete efficiently
- Programmes for Vocational Education and Training (VET) have to prepare students for a labour market in which flexibility and the ability to adjust are as necessary qualifications as is competence in specific vocational skills.
- New concepts-models of learning have to be available quickly. All parts needed for this are already known. To draw these together and create learning opportunities that match natural learning strategies and exploit the potential of the new technologies of information and communication is one of the challenges we now have to take up.
- VET Colleges can and have to play an important role in local and regional development and can and have to become leading actors in an integrated regional development model which is based on longterm partnerships with industry.
- To meet the challenges of the 21st Century for VET Colleges co-operation through strategic alliances and networks is essential!

Introduction

This presentation is not about the use of international networks and the kind of profits that networks can give colleges. I think that will be obvious for every one who is involved in education.

This presentation, in the context of the challenges of the 21st Century for VET, goes more into the necessity for VET colleges to develop strategic alliances or networks (*national* and *international*) and to see and to use these alliances as an instrument which can contribute very effective to the college's:

- innovative capacity,
- responsiveness to the needs and demands for education and training,
- aims and objectives,
- position and roles in its community,

VET colleges have to learn much better to understand they cannot operate anymore isolated from the world around the college, without an open eye for and a responsive attitude to that world. They have to learn and understand that they are part of a complex of institutes and organisations, which existence have an impact on one and each other. Because of this growing interdependence from each other, these relations are getting a new meaning. In order to get control and influence on the forces in the college's environs the college has to enter into alliances or networks and has to use the partners' strength for its mission: *to deliver education and training programmes which meet the needs and demands from their community and beyond*. This awareness has to be stated explicitly in the college's strategic policy and action plan.

The Context: The Challenges

In order to judge the need for strategic alliances-networks in VET in the context of the challenges of the 21st century for VET, we have to know what these challenges are. In my opinion the most important developments and trends which will challenge VET and will have an impact on the future needs for VET for the coming decade are:

- some demographic developments in western societies: the arise of the multicultural and bilingual society, more elderly people and less young people,
- the strong rise of the information society,

- the internationalisation-globalization of the economy and labourmarket,
- the impact of the information, communication and other advanced technologies on the organisation of the production processes and labour,
- and because of that the growing need for lifelong learning.

These developments will effect the needs and demands for VET, the organisation of our colleges, the teaching and learning concept, the professional profile and role of the teacher.

These developments and trends are the drive of *the challenges* for VET for the coming period and those challenges are the same where ever VET is provided:

- the learning process has to become more flexible and individualised,
- programmes and curricula has to modulised,
- the introduction and implementation of new technologies in VET,
- the development and implementation of a new (lifelong) learning concept,
- the involvement of trade, business and industry in VET,
- the development of a transparent system of qualifications,
- the politicians, governments and authorities and social partners have to recognize VET colleges financed with public money are qualified and facilitated to deliver programmes that meet the needs and demands for education and training and are the first and most important (and best) suppliers of vocational qualifications!
- the need for a complete change in college culture, and the attitude of the management, the teachers and non-teaching staff.

To meet these challenges co-operation in networks or strategic alliances is essential! Colleges cannot do this on their own!

Explanation-Background (Another Approach)

More than ever the interest in VET of Governments, business and industry, trade unions, regional and local authorities and others is growing.

Since the beginning of the seventies the economy of the industrialised countries go through fundamental, structural changes. Mass industries which stimulated the economy during the last 50 years are no longer competitive on the world market.

The only way in which the high developed western countries can maintain and improve their high standards of living is concentrating on the high values of the old industries (if they are still in force) and on new industries run by advanced and future technics. This new type of (service and information) industry needs much more flexible and responsive organisation structures as we were used to have in the old standardised mass industries.

In the seventies and eighties the western societies are entering a new period in which, under influence of new technologies and the production of new products, a new production structure is developed with the emphasis on flexibility, workers participation and equality.

The demands of the modern industry on its labourforce are influenced by the use of modern technology. Workers have to relate themselves much more to production processes, in which as well as machines, as materials, as people will be steered by computers. This lead to the need of new qualities:

- abstracts thinking (the manipulation of thoughts and patters)
- system thinking (interrelated thinking)
- the understanding of processes
- statistical insight and understanding
- communication (speaking, listening, writing and reading)
- experimentation
- collaboration
- individual responsibility
- teamwork
- inter personal skills
- creative thinking

Flexible production needs a highly educated and trained workforce which is able to work with autonomy and which is prepared and willing to think and to be creative.

More than ever we have to realise that an extensive system of education, training and retraining with a concept for lifelong learning is a conditio si'ne qua non for economic growth and development.

The transition of mass production in a modern flexible computerised production systems requires:

- VET that is close related to the practice of the production-working practice,
- a work practice experience place in which working and learning are no longer separated. .

In the modern, post industrial society the position of education in general and of VETin particular becomes a strategic one. In many western industrialised countries a process of fundamental change in the system of VET is going on aimed at the improvement of the effectivity, quality and performance of VET. The innovated VET systems are more or less characterized by the same elements: a growing autonomy of the VET colleges, a rising concern for the requirements of the labour market, a self regulating system in which various actors (participants, VET colleges, local and regional authorities, business and industry) and the government try to be in balance with one and each other in the field of VET. Another important element of the innovated systems is the aspect of the introduction of a performance-based funding scheme.

In the context of all this the relationship VET-business and industry has to be a structural and dynamic one for a better reflection in the VET system. There is a need for structural involvement of the social partners in VET in setting the qualifications and the programmes and in offering enough work experience places.

Strategic Alliances - Networks

It is clear that knowledge and learning should become a central aspect of social and economic activity throughout the society. It is also clear that VET Colleges have a crucial role to play in the needs and demands for new skills, new forms of learning and for providing new opportunities to learn lifelong.

Transforming this vision into reality however is a process in which not only education and training institutions, but a whole range of actors, have to recognise their own responsibilities and to play their role in creating the right conditions for stimulating the necessary change and innovation: to make it work. The main actors are:

- education and training institutes,
- the world of trade, business and industry[1]

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[1] This includes the non-profit sector, agriculture, ect.

- European and national governments policy makers.

New, daring and unorthodox strategic partnerships and co-operation in strategic alliances between the main actors in the field of VET is essential in order:

- to serve the mutual interest of all actors: knowledge and learning become a central aspect of social and economic activity,
- to find a balance and coherence between the roles, responsibilities and contribution of all actors to an up-to-date VET system and programmes;
- to manage successfully the inevitable process of change and innovation;
- to provide responsive VET-programmes which meets the needs and demands;
- to develop and implement concept(s) of lifelong learning.

Successful, meaningful and productive partnerships between VET Colleges and the actors will also help:

- to bring down the stereotyped views which each have of the other and will lead to acceptation, recognition and co-operative and creative breakthroughs;
- to share good practice, know how and experience, which will strengthen and enrich the process of innovation and change;
- to transfer information;
- to speak with one voice to and with the decision-makers and politicians in order to have some influence on VET policy, the legal frame work and the financial conditions for VET.

With respect for and recognition of each responsibility new partnerships between the actors in VET are needed in order to be able to deal together effectively, efficiently and adequately with the enormous consequences of the developments and changes. All the mentioned actors have of course their own responsibility, role to play and their own specific interests, but what they all have in common is the responsibility to maintain a system for learning (education and training), which prepares young people for the future and provide lifelong learning to which every one has access. That has to be *the* priority of all actors in education and training. This can only be realised in close co-operation and collaboration in strategic alliances, partnerships and networks. All the other interests are of minor importance and have to serve in coherence and harmony priority number one!

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A Comparison of Occupational Programs in the Comprehensive High Schools among the U.S.A., Japan and Taiwan

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Abstract

America-style comprehensive high school system has been tried out in Japan and Taiwan since 1994 and 1996, respectively. Most comprehensive high schools in Taiwan are transformed from senior vocational schools. In order to assist these senior vocational schools to successfully transform their transformations in occupational programs, the author visited some educational institutes in the U.S.A. and Japan to learn the status and experiences of their comprehensive high school system. As a result of the field visitation and a related literature review, a comparison of occupational programs in the comprehensive high schools among the U.S.A., Japan and Taiwan were made and the implications of the result to Taiwan were suggested.

Background

In Taiwan, academic-oriented senior-high schools and occupational-oriented senior-vocational schools were separated. The occupational programs in these senior-vocational schools have normally offered three years of occupational preparation. Since the school year of 1996, 18 senior high or vocational schools began to tryout an American-style comprehensive high school system, which provides students with occupational-, general- and academic-oriented pathways. After July 1, 1997, the number of comprehensive high schools will increase to 44. In the comprehensive high schools, occupational programs provide students with two years of occupational preparation. Because most of those 44 schools were or will be transformed from senior-vocational schools, their three-year occupational programs should be restructured to two-year programs. Many vocational educators concern about the solutions to the restructure problem.

The United States of America (U.S.A.) has widely operated comprehensive high school system for a long time and Japan began its comprehensive high school system in 1994. In order to learn some implications from the U.S.A. and Japan to suggest further reforms in the transformation from senior-vocational-schools to comprehensive high schools in Taiwan, the author visited some educational institutes in the U.S.A. and Japan. As a result of the field visitation and a related literature review, a comparison of occupational programs in the comprehensive high schools among the U.S.A., Japan and Taiwan were made and the implications of the results to Taiwan were suggested.

Because the author will go to the U.S.A. to visit more educational institutes at the end of March, 1997, the process and results of the study leading to this paper will be presented in detail in a finalized presentation paper.

An Overview of Vocational Education in Botswana, Swaziland and Zimbabwe

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1. Introduction

The purpose of this paper is *firstly,* to look at the development of a general policy for training for vocational competence in Africa, then secondly to look at the different vocational education systems that have been put in place by Botswana, Swaziland and Zimbabwe.

2. Policy Development for Training for Vocational Competence

A well trained work force is of vital importance for any country to be productive and ensure a satisfactory economic growth. There is widespread agreement that general cognitive skills such as reading, writing, mathematics and scientific understanding are taught most efficiently in a formal school setting. It is important to realise that the effective teaching of these general skills, is a very important foundation for any further studies as well as mastering certain job-specific skills.

There is also widespread agreement about the necessity for occupation-specific skills. However, *"the most efficient timing, methods, and venue for imparting these more narrowly vocational attributes are subjects for debate."* [1]Is it therefore, more cost-effective for individuals to acquire job-related skills in schools, after completion of school but before taking a job, or after securing a job? What will work in one country does not necessarily work in another. Each country must find the most cost-effective system that will satisfy its particular needs.

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[1] A World Bank Policy Study, Education in Sub-Saharan Africa, 1988, page 62

For many years there has been pressure on African countries to increase the vocational content of the school curriculum. Since most of the secondary students will not continue their formal education, it is argued that the schools should provide specific vocational training that will give them immediate prospects for employment. This applies especially to countries with a small industrial base and where employers have abandoned the traditional apprentice schemes because of the small numbers involved. This route was taken by a number of countries in Africa and they started to set up specialised vocational schools independent from the general education system. Others diversified secondary schools offering a core curriculum for a number of vocations, i.e. pre-vocational education and training.

Experience has however shown that schools generally are not the best place in which to train students in most specific vocational skills with the possible exception of some commercial skills, such as accounting and typing. These have wide applicability and relatively low requirements for expensive equipment and facilities. The following are some of the reasons why they are not suited for this type of training:

- schools have trouble recruiting and retaining competent instructors and the instructors find that their own skills quickly fall out of date;
- they generally find it difficult to provide realistic work experience;
- equipment used tends to become technically obsolete; and,
- schools are slow to adjust to changing market conditions and to change to the mix of skills needed.

Vocational training seems to be best provided after students have secured initial employment at venues closer to the control and supervision of the employers or at vocational training centres set up for that particular purpose. The emphasis in Africa should be to design for each country a system of vocational training on this principle. What is important, is that a great deal can be accomplished by ensuring that existing facilities with expensive equipment are fully utilised, curricula are maximally responsive to the often changing requirements of the employers, and that teachers have adequate real-world experience in the jobs for which they provide the training.

Therefore it seems that governments that are interested in laying the groundwork for a more technically orientated economy in the future should firstly, place heavy emphasis on general mathematics, science and language skills in the secondary and post-secondary curriculum. These subjects are relatively inexpensive to teach and are likely to promote economic growth more efficiently than can in-school vocational education. Secondly, at the same time, they should be exploring other avenues that may help to raise the volume of training provided by vocational training institutions and by the industrial and business sectors.

With this general introduction and background I will now look at the vocational educational systems of Botswana, Zimbabwe and Swaziland.

3. Botswana

Background

The population estimate for 1995 was 1.45 million with about 48% of the population under the age of 15 years. In 1991 about half the labour force was employed in the formal sector while the other half was in either the informal sector in traditional agriculture or unemployed.

Between 1980-91 the Gross Domestic Product (GDP) increased by an annual 9.8%. This growth can be attributed mainly to growth in the mining sector (diamonds), with agricultural activities decreasing mainly because of the droughts experienced during this period.

Botswana follows a 7-3-2 system with 7 years primary, 3 years junior secondary and 2 years senior secondary education.

Technical and Vocational Education

The *Vocational Education and Training Development Plan* of 1992 revealed that only 2 400 of the 36 672 pupils who completed junior secondary education in 1987 continued with vocational education (6.5%); 1 200 joined the Brigades and 1 200 attended other forms of vocational education. A further 2 000 took up employment in the formal and informal sectors; the remaining 22 000 were left without further study opportunities or were unemployed.

The National Commission on Education (1993) was appointed to review Botswana's education system. Part of the brief of the Commission was to *"....vocationalize the curriculum content...."* The curriculum was adapted to make provision for certain vocational subjects to be introduced and at the same time the expansion of the existing vocational training centres took place, with new courses being introduced and student intakes in existing training programmes increased. Specific training programmes catering for sectors critical to the country's development, such as manufacturing, industry and services, were also introduced to address specific needs identified in these sectors.

Vocational training centres concentrated on artisan training in co-operation with the Ministry of Labour. They followed the traditional British artisan training system, nine months per year spent with the employer and three months theoretical training. This was then replaced by a system modelled on the German Dual System - because of German funding for the training!

In 1993 18 trades were registered, including trades in the commercial, computer and related fields, and more than 300 employers participated in the scheme. However, subsequent to this, many of the students found it difficult to secure contracts with employers with the result that the vocational training centres and some Brigades had to re-introduce the practical training for apprentices.

The *Brigades* were originally designed to offer children who could not gain access to secondary schools the opportunity to acquire practical skills. They were supposed to

- be closely linked to the community
- address the needs of the community, and
- assist with the development of the community.

It was also envisaged that the trainees would become entrepreneurs. They would use the skills they had acquired within the communities and therefore assist with the development of the infra-structure needed. The objectives, although laudable, were perhaps too ambitious and administrative problems, lack of motivation, inefficient management and increased government control were cited as some of the reasons why they were not very successful.

On a tertiary level the Department of Technical Education of the Ministry of Education provides facilities for students to study for a higher technical diploma or a degree. In 1994 there were about 4 000 students registered at the *University of Botswana* and 750 enrolled at the *Botswana Polytechnic*. Hopefully with the emphasis now placed on technical and vocational training, this will rectify the disparity between enrolments at the University and the Polytechnic.

The Botswana Polytechnic offers programmes in civil, mechanical and electrical engineering at technician level and also teacher training in design and technology for secondary schools. Both practical work and professional problem solving in a technical environment are dealt with. The training offered by the Polytechnic is based on the City and Guilds system of Britain and is financially supported by British aid while, as mentioned, the artisan training is based on the German dual system and funded by Germany. This has created a certain discontinuity in the education system and tension between the donor aid countries[2].

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[2] Nieuwenhuis, F.J. 1996. *The Development of Education Systems in Post-Colonial Africa*. Pretoria. Human Science Research council, page 19.

4. Swaziland

Background

Swaziland is a small land-locked country bordered on three sides by South Africa and on the fourth by Mozambique. The topography of Swaziland gives rise to great differences in rainfall and climatic conditions and makes agriculture vulnerable to droughts.

Swaziland received independence from Britain in 1968. The new constitution vested supreme executive and legislative power in the hereditary king who is also the head of state and provides for a bicameral legislature (house of assembly and a senate) whose function is confined to debating proposed legislation and advising the king.

The economy of Swaziland is inextricably linked to that of South Africa with agriculture being the backbone of the economy and employing nearly two thirds of the work force. The bulk of the manufacturing sector consists of adding value to agricultural produce for export purposes.

Based on 1990 estimates the population of Swaziland will increase to 962 000 in 1996.[3] The rapid growth has negative implications for both the economic and social welfare of the nation because it aggravates such problems as unemployment, degradation of the environment and the provision of quality education.

The education system of Swaziland consists of seven years primary, followed by three years junior secondary and then followed by the two year senior secondary education which prepares students for the "O" level examinations. The intention is to change this as soon as possible to a nine year basic education system followed by three years academic education or three year pre-vocational education.

Technical and Vocational Education

When a 1988 survey pointed out that 75% of all high-level technical jobs were held by expatriates, the Ministry of Education realised that something needed to be done to improve the provision of technical and vocational education in the country.

The curriculum was made more responsive to the socio-economic and manpower needs and, at the end of 1992, about half of all primary schools were offering a diversified curriculum which exposed the students to a number of practical subjects such as agriculture, home science, technical and commercial studies.

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[3] Nieuwenhuis F.J. 1996, op. cit., page 82.

On a senior secondary level the *vocational and commercial training centres* offer training in engineering, including ten different skill areas in business administration, hotel and catering and secretarial studies. The proposed pre-vocational programmes to be introduced at secondary school level will offer academic and pre-vocational subjects at a number of pilot secondary schools. They will start with a number of exploratory activities in practical subjects in Form I, II and III before narrowing the focus in Form IV and V to more specific occupational skills.

On a tertiary level the *Swaziland College of Technology* also offers advanced technical and vocational programmes with "O"-levels required for admission. The programmes include mechanical and civil engineering, water technician training, hotel and catering and business management. They also offer a Technical Teacher Certificate for teaching technical and vocational subjects in secondary schools.

More than 60% of the students enrolled at the *University of Swaziland* are in social sciences and humanities with a very small percentage in science and agriculture. They need to consider the introduction of a demand driven system where enrolments are linked to job opportunities and thus actively encourage enrolments in science and technology.

5. Zimbabwe

Background

Zimbabwe is land-locked between the Limpopo and Zambezi Rivers covering an area of 389 700 km^2. Zimbabwe only gained independence in 1980 after a long and bitter war of independence in which 27 000 people were killed. According to a 1992 provisional population census result the total population of Zimbabwe was 10.4 million. The total labour force was estimated at 3.9 million in 1991, of which an estimated 2.65 million (68%) were involved in agriculture.[4]

The newly independent Zimbabwe inherited a broadly-based economy with a diversified industrial infrastructure. Its mining, chemical and construction industries were relatively advanced and with the exception of petroleum, was self-sufficient in terms of its energy supply. After Independence both the agricultural and industrial sectors were able to expand rapidly because of the lifting of sanctions. The result was a real growth rate of 8% in 1980.

Segregation between Whites and Africans formed the basis of the economy, the social order and educational provision. Educational provision for Africans was inferior to that of Whites and was aimed at entrenching the privileged position of the Whites. The challenge the new government faced after Independence was to rectify this situation. The Transitional National Development Plan (1992) (TNDP) stated that there was a need to *"act with unity and single-mindedness if the ultimate goal of an egalitarian socialist and integrated society is to be obtained."*

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[4] Nieuwenhuis, F.J. 1996, op. cit., page 140.

After Independence very little was done to change the structure of the education system. Seven years of primary education was retained followed by six years of secondary education, four years up to the "O"-level examinations then another two years for the "A"-level programme.

Enrolments at primary and secondary schools increased dramatically until 1988 and thereafter started to decline mainly because of an escalation in school fees, a loss of confidence in the benefits of education as a result of the increase in the educated being unemployed and also a decline in the quality of education. The increase in the number of private schools is a direct result of the drop in educational standards.

The drop in the quality of education is one of Zimbabwe's greatest educational challenges. Whether quality is measured by infrastructure, the teaching process or examination results, Zimbabwe shows signs of deterioration. The "O"-level examination results released in February 1995 showed a 22.9% pass rate. Only 26 526 out of 115 893 students who sat for the examinations passed. Comparing this with the 1980 results, when 80% of the students passed, gives rise to serious concerns. It is argued by some that this is a direct result of the policy of automatic promotion adopted after Independence.

Technical and Vocational Education

Since Independence various measures have been taken to orientate education to the world of work. Practical and technical subjects that impart specific vocational skills, have been introduced. The government has also introduced a new structure for technical and vocational education aimed at streamlining and rationalising technical and vocational education. According to the new structure all the students up to Form II in secondary schools have to study technical subjects as part of their general education and at Form III and IV, one technical subject has to be taken alongside the "O"-levels leading to the award of the National Foundation Certificate (NFC).

Prior to independence the training of artisans was modelled on the British system of an indentured apprenticeship of four years. Although the system of training was retained, the number of apprentices dropped appreciably. The decrease was mainly due to mistrust in the Government's system of national registration of candidates, the declining quality of the candidates, the very poor quality of the training and the deep economic recession which resulted in fewer jobs being available.

Thirteen *Youth Training Centres* aimed at skills training have been established since Independence. The admission requirement is an "O"-level certificate and students are able to write a trade test, levels 1-4, during the three year training period. The students normally spend two six-month periods of attachment to industry during their second and third year.

On a tertiary level the *polytechnics* offer programmes in engineering, management and a number of other options. The *agricultural colleges* prepare students for a career in the agricultural sector.

Vocational and technical education does not meet the needs of the majority of people in Zimbabwe and although the Government has introduced various programmes to try and address these needs it is clear that the solution to technical and vocational education and training has not yet been found.

6. Conclusion

The research undertaken to obtain this overview of the vocational education systems of Botswana, Swaziland and Zimbabwe has brought me to the following conclusions:

- Mathematics, science and language skills acquired at school level lay an essential foundation for a more technically orientated economy and are more likely to promote economic growth than too early specialisation in vocational education skills;
- A very small number of students on senior secondary school level compared to most Asian and European countries, is channelled to vocational education and training;
- Due to massive unemployment and drought it has been very difficult for these countries to provide sufficient funds for an effective vocational education system.

7. Recommendation

It appears that countries in Southern African have created and developed their vocational education systems in isolation, although there are many similarities within these countries. It is therefore recommended that a networking system to facilitate contact between vocational education institutions, government and business should be set up and utilised for this purpose. IVETA may be the ideal vehicle to facilitate this networking.

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Identification and Utilization of Education Trends for Cooperative Education Enhancement

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Abstract

Keeping cooperative education programs current with education trends is an ongoing challenge. New ideas and trends should be addressed by cooperative education personnel. Creative approaches need to be utilized as many areas of a school community are not served by a program that offers supervised field experiences related to students' studies, for school credit on a paid or non-paid basis. Reviewing current literature in the field of education, and collecting information about unique programs using cooperative education procedures, served as the basis for the suggested strategies in this study. Information about serving all students and incorporating education trends into existing programs is included. This information will assist planners, curriculum specialists, teacher-coordinators, and administrators who are interested in providing field-experiences to all students.

Introduction

The concept of cooperative education has been in the American public schools since its legislated inception in 1936. There are different kinds of cooperative education programs that schools may include in their curriculum. The common thread among all programs is that they bring the student and employer together for school-supervised training, and include paid part-time work related to students' studies and to the school program.

Variations of this format may be a supervised field experience or internship. In all cases the students also receive school credit for this activity.

Purpose

To enable cooperative education program content to be current, trends in education practice were identified from education literature and from interviews that could be applied to the operation of programs. Programs could utilize contemporary education concepts in their instruction and procedures.

Concepts

Vocational-Technical Education is intended to prepare students for sailable skills.

A relatively small number of students actually have a paid or non-paid field experience related to their studies or to their career objective.

All students involved in classroom/shop instruction designed for employment preparation, should be required to have a supervised field-experience in their senior year in the actual workplace setting as part of realistic training.

New developments and trends in both education and business/industry should be incorporated into cooperative education programs for students' employability training.

As a method of instruction, cooperative education can serve the entire school community.

Significance

Providing experiential learning to students interested in career preparation is essential to any program. Cooperative education programs may be based on federal and state funding, but there are other programs developed by the local school that are part of the school curriculum and are supported by the regular school budget without special financial assistance from outside sources. These programs meet an educational need in the local school.

Educators should be aware of the value of cooperative education/field experiences in all areas of the instructional program, at various grade levels. From the exploration of careers to skill development, there is a whole range of possible field experiences based on students' needs and program objectives. A great number of students could benefit from these school-sponsored experiences as they prepare for their futures.

Programs will hopefully utilize this information to enhance their functions, and to assist planners, curriculum specialists, guidance counsellors, administrators, and teachers. Vocational-Technical educators should be aware that there is opportunity in the academic areas for cooperative education processes.

Procedures

Information was collected from education journals, publications, books, and reports about trends that could possibly be incorporated into any program involved with cooperative education, field-experiences, school-to-work, and internships. Both formal and informal approaches were used. Information about existing unique programs in various schools was collected through interviews and meetings. The trends and program information were reviewed for their possible value to the cooperative education field. Approaches and strategies were suggested to educators.

Findings and Conclusions

Cooperative education is often considered as a program, and sometimes as a method of instruction. It brings the student and employer closer together for school supervised training opportunities and for possible relationship after graduation. Included in the program is paid part-time work that is related to the school program, or it could be in the form of an internship or field experience that is closely supervised by the school. The value of having the teacher-coordinator visit and observe the workplace and then bring the information back to the class is one of the stronger points of the supervised work situation. The feedback is most beneficial to both the student and teacher, as well as to the school program.

Rationale for having a cooperative education program could be for the following reasons:

- Skill Development - actual job skills are practised and developed both in school and in the workplace
- Employment Preparation - learning to obtain and hold a job without a career objective

- Personal Development - using the program and workplace to develop personality and a stronger self-image
- Career Reinforcement - observing and practising in the workplace prior to further education
- Social/Economic Adjustment - observing and practising to develop skills in getting along with other people and groups.

Serving these segments of the school community results in everyone benefitting from the schools' efforts to help students adjust and develop to be better prepared for the future. Nomenclature of programs utilizing supervised field-experiences included: Cooperative Education, Apprenticeship, Youth Apprenticeship, Supervised Work Experience, Career Awareness, Special Needs, Industry-Education Coordination, Work-Study, Diversified Occupations, Marketing Education, Capstone, School-To-Work, and Workplace Education & Training.

A variety of themes were employed in different programs. These themes included: Bridging the Gap: Classroom To Employment, Student Job Placement, Sponsored On-The-Job Training, Employment Training, Employability Skills, Internship, Externship, Practicum, Observation, Hire Education, Learning By Doing, Field Experience, and Earn While You Learn.

Programs for academic students intended to reinforce students' career objectives included names of: Educational Field Experience, Social Lab (Laboratory In Society), and Community Study. These programs do not have paid work, but do have school placement, supervision/evaluation, and carry school credit. Students are able to develop and reinforce their career objectives. Also, some students use these programs as a mechanism for voluntarism. Many schools have some form of field-based activity for academic students, but there is no central source of information about these programs. Vocational education personnel trained in Cooperative Education could conduct these programs if they were aware of their existence.

The education community has been looking at the theories of Howard Gardner on multiple intelligences which are broken down into seven components: spatial, bodily-kinaesthetic, musical, linguistic, logical-mathematical, intrapersonal, and interpersonal. All seven intelligences are used at the same time as part of the classroom projects. This concept can be used in cooperative education classes as part of a core curriculum, project method, or cooperative learning. Students are involved in theoretical approaches, application of information, and testing of ideas as part of "holistic approaches" in teaching/learning activities. Addressing these intelligences in the classroom makes students "more well rounded, makes school more engaging and motivating, and enables more students to succeed."

Action research could be used more by each program to identify its operation and possibly trends. Action research is simply "studying what you're doing" through disciplined inquiry. Examples of action research for cooperative education include: monthly hour and wage report that students achieved, workplace assignment reports, monthly or weekly employer-evaluations report, community employment - needs surveys, student occupational-interest surveys, parents' opinions about their child's workplace assignments survey, and many others depending on program needs. Teachers record useful data and then analyze them closely. A well-run cooperative education and school-to-work program could include monthly dissemination of information to the school principal and to the superintendent, and possibly to employers.

Implications and Recommendations

Daily class or seminar that focuses on job problems and employability skills are essential to the ideal cooperative education or school-to-work programs.

A basic component of each program or class is when students listen to each other and exchange information about their work experiences, they develop a better perspective about the positive and negative aspects of the workplace.

Visiting and observing students in the workplace and then bringing information back to the class is most beneficial to both the student and teacher, as well as to the school program.

Meeting the real occupational needs based on employers' impressions and based on trends in education is the way for programs to keep current.

Trends that should be incorporated into cooperative education programs include use of: Multiple Intelligences Theory, Action Research, Serving Academic/Special Needs/Adjustment Populations, and Helping School-To-Work Programs.

A majority of vocational-technical students need to experience some form of cooperative education or field experience as part of their program in order to be realistically trained.

Additional students may also benefit from cooperative education for career reinforcement, personal development, social/economic adjustment, skill development, employment preparation, and job placement when incorporated into academic, special needs, and other programs.

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Nursing Student Information Network: Fostering Tutorial Communications Using an Electronic Mail List

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Abstract

This paper presents the development and implementation of a student-based computer information network between students at two nursing colleges. An electronic mail list was established as a pilot project for student nurse tutoring in autumn 1996. It was used to communicate information and to facilitate collegial interaction between students during their first year of study. The project demonstrates that an e-mail list can be used effectively to communicate with and inform geographically distant student nurses. However, most of the students were dependent on access to computers at colleges for their discussions and tutoring.

Introduction

The completion of nurse education in Finland requires 140 study weeks i.e. three and a half years (seven terms) of full-time study. Counselling and tutoring are essential at the beginning. At nursing colleges, teachers, counsellors and students as tutors all give much information to beginners in their first term. The first study year usually consists mainly of basic theoretical studies. At most colleges, student nurses usually have their first experiences of caring for patients or clients at the end of their first year. This involves feelings of both fear and frustration, and also of excitement, among students. Despite the close tutoring system, new ways of peer communication are also needed. This paper describes experiences of the use of an e-mail list for fostering tutoring and collegial communication among student nurses.

Background

Advanced technology is used daily for studying in nurse education. Access to the Internet has opened the "information superhighway" for student nurses (Tomaiuolo 1995). Computerized networks, news groups, bulletin board systems, and the World Wide Web serve as alternatives to telephone, written, and face-to-face communications. Computer networks permit users to read, send and receive messages in complete privacy and at a time convenient to them. This flexibility is important in studying, where sensitive problems also arise unpredictably. (Brennan et al. 1991, Hekelman et al.1994, Anthony 1996.)

Computer networks allow expressions of anxiety or frustration without face-to-face contact. According to Ripich and al. (1992), participants who were able to help others by their computer messages demonstrated great satisfaction with their ability to contribute to the lives of others. These results reflect a positive effect of the use of electronic mail both on students themselves and also on them as future professionals. (Wheeler 1992.)

E-mail allows one user to talk to another user through a computer - possibly thousands of miles away. It is not restricted to one- to one-communication; a list of e-mail addresses can be used by a program (a listserv or majordomo) to produce an electronic mailing list. Anyone on the list can send a message for distribution to all other users, by sending the message to the listserver. (Anthony 1996.)

The Pilot Project

The purposes of this pilot project were to: 1) develop and implement a student-based computer information network; 2) orient student nurses at two nursing colleges to using an e-mail list; 3) evaluate the outcomes of the project.

Planning Process

The starting point of this project was the ideas of two teachers, one computer instructor and one nurse teacher, to enhance student nurses' abilities to use computers as a tool for their studies. The information exchange between students at two different nursing colleges was regarded as an advantage for peer communication. The teachers at both colleges acted as leaders of the project in their colleges. The listserver used in the project was located in the other college.

Because the colleges are located at a distance of 200 km from each other, the use of networks was evident. Thus, it was decided to use an e-mail list to disseminate information and to promote discussion about studying, i.e. to provide a forum for debate. Student nurses in the second and third term of their education were invited to participate in the project with their tutors. It was decided to give them e-mail addresses on a voluntary basis. The ideas of the project created an e-mail list called "NurseInfo" (in Finnish "Hoitotieto") which was introduced to the students during their computer classes.

Evaluation

The evaluation of the project had two purposes. The first was to find out what were the student nurses' perceptions of the use of list, and the second to analyze the frequency of use, as well as the content, of the messages.

At the time this paper was presented for inclusion in the conference proceedings, the pilot project was still in progress. According to the initial outcome, the motivation to join the e-mail list was not very strong among the students. However, additional information about the use of an e-mail list aroused more interest.

A total of 33 student nurses took part in the project. The students had started their education in January 1996 in Hämeenlinna and in autumn 1996 in Porvoo. The different stages of the students' education were seen as a benefit for the project. Eight teachers from Hämeenlinna and one from Porvoo also joined the list.

The initial outcome also demonstrates that the students were not eager to start discussing. The teachers and tutors who had also subscribed the list tried to "wake up" the participants with questions about practical training in hospitals. Despite this "restart" the students did not want to discuss clinical nursing. They preferred to talk about the teaching, and about learning theoretical subjects. They also replied to each other personally rather than via the list.

A significant drawback has been that access to computers has not been possible during clinical training. Only those who were able to access the Internet at home could use the list at this time. However, these students also preferred to comment on topics other than those concerning clinical training. The training sessions at both colleges occurred one after the other. A minority of students came to college during clinical training to use e-mail.

The teachers on the list were also mainly "lurkers". Only the tutors tried to activate the discussion.

Summary and Conclusion

As a nurse educator, on the one hand I should be content that student nurses are obviously satisfied with the guidance they received from their teachers and mentors during clinical training. On the other hand, I think tutoring as a method of a nursing needs to be strengthened at the teaching stage. If students are used to asking their colleagues' opinions and feedback during their education, it is likely that they follow the same pattern in their nursing practice.

Obviously student nurses need more training in computer use. The number of students who used e-mail was insignificant. More detailed instruction needs to be carried out before other students join the list. Netiquette, i.e. how to behave on the list, must also be covered more during computer classes.

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The Process Model of Cooperation between Upper Secondary Schools and Vocational Institutions

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Abstract

In the article a tentative process model of cooperation of upper secondary schools and vocational institutions is introduced. The model is grounded in the follow-up studies and audits of the Finnish Upper Secondary Level Experiment that started in 1992.

The model is based on the local networking and cooperation between upper secondary schools and vocational institutions and is part of the Upper Secondary Education Experiment launched in 1992. The experiment investigates the following central elements: 1) freedom of choice in constructing personal study programmes, 2) local networking and cooperation between educational establishments, and 3) new ways of combining academic and vocational teaching and learning.

The process model of cooperation between schools calls for interdependent development in three major areas: 1) introducing diversity into study programmes, 2) joint scheduling and 3) joint development of the curriculum and teaching/learning methods. The three phases of the model entail a gradual opening up of possibilities to the student of constructing his/her personal study programme along with the gradual introduction of open and flexible scheduling devices. The development of teaching and learning methods will ensue once the teachers get to know the curricula also of other schools.

Keywords: cooperation between schools, network of schools, upper secondary education, vocational education, personal study programme.

Introduction

The local networking of and cooperation between upper secondary schools and vocational institutions are part of the Finnish Upper Secondary Education Experiment launched in 1992. The purpose of the experiment was to study, how cooperation between institutions can be used to raise the standard of postcompulsory education and to meet the ever changing demands for knowledge and vocational certification. Another object is to explore the possibilities of diversifying education and creating flexible and individualised study programmes, combining academic and vocational studies that have been chosen from the local network of schools. The aim of the experiment is to mutually enrich academic and vocational education (Numminen & Virolainen 1996).

Collaboration between academic and vocational teachers is usually restricted to one school (e.g. Berryman & al. 1992) or specific programmes (e.g. Morton 1991). Since there were no ready examples available of local or regional cooperation between schools concerning student choices on a daily or weekly basis, the network and cooperation methods and tools had to be developed by the participating units themselves.

Design of the Experiment

The upper secondary education experiment consists of 16 local or regional units, networking between them upper secondary schools and vocational institutions. Each unit has a local management. The individual networks consist of 8-9 schools on average. Distances between the schools vary from sharing a common schoolyard to locations as far as 20-40 km apart. The number of participating students is 35 000, ranging from 350 to 6000 per unit (Numminen & al. 1992).

The main elements of the experiment can be described as: 1) freedom of choice in forming personal study programmes, 2) local networking and cooperation between educational establishments, and 3) new ways of combining academic and vocational teaching and learning.

The students select their personal study programmes from the options below. In all programmes the compulsory subjects have been substantially lessened, allowing for 30-40 percent of the studies to be chosen from other schools.

1) Upper-secondary students may include studies from other secondary schools or vocational institutions.

2) Vocational students may include studies from upper secondary schools and studies from other vocational institutions in their study programmes.
3) Upper-secondary and vocational students may opt for a combined programme comprising both general and vocational subjects.
4) Upper-secondary and vocational students may choose studies from other educational establishments, like adult education institutions, polytechnics, open universities, and summer universities. They may also include studies abroad and/or work experience in their programmes.

Methods and Procedures of Follow-up and Analysis

The methods of the follow-up comprise 1) annual questionnaires to the local management groups of the experiment, containing questions about the development of the schools network in different areas, e.g. the organization of joint counselling and tutoring, the overhaul of the joint provision of courses, joint scheduling, periodisation, the joint provision of teaching and learning, the joint use of premises etc., 2) annual statistics of the students' choices from other schools or other vocational fields, 3) auditing the experimental units, 4) two follow-up studies (Virolainen 1996, Vuorinen 1996), one on the quantitative and qualitative aspects of the choices made by one student cohort, the other on the emergence of cooperation patterns and models of schools activities and learning. An international evaluation was performed in 1994-95 (Arnman & al. 1995). The follow-up report is published annually (Numminen & al. 1997).

The data gathered is mostly qualitative, except for the students' choices. As a consequence the methods of analysis are mostly qualitative (Strauss & Corbin 1990).

The design of the experiment - the networking and cooperation of schools with different learning environments and varying school cultures, and the construction of individual student study programmes - suggests some connection with earlier educational debates. So for instance, the hidden curriculum may be different in the overall network of schools and among the individual students as choosers (Broady 1994). Core qualifications and/or future skills might be enhanced by combining multi-vocational and academic learning environments. The increasing autonomy of the student as constructor of his/her personal study programme suggests connections with the discussion on non-traditional learning (Ziehe 1991).

Main Results

Below some of the most noteworthy results of the experiment will be given (cf. Numminen & Virolainen 1996):

1. The options offered by the school network have increased rapidly and the students have taken advantage of the options open to them, thereby enriching their study programmes. The number of students choosing studies from other schools or other vocational field has increased; on average 26% of the students in upper secondary schools and 32% at vocational institutions have chosen at least one optional course (range of variation 1-40 courses). The differences between the experiment units varied in 1995-96 between 12% and 82%. The contents of the choices varied from practical skills to clarifying one's vocational orientation and broadening one's eligibility for higher education.

2. Several models have been introduced of how to organise locally the joint provision of courses, some of the models overbridging also the long distances between the schools. Most of the models require the modularisation of the syllabi, the periodisation of the school year, and teaching arrangements involving a non-graded school.

3. Another way of diversifying academic and vocational studies is through the curriculum: developing teaching and learning methods and novel forms of studying that build on and utilize the differences between academic and vocational schools or/and combine academic with vocational or theoretical with practical studies. This development has been somewhat slower, but is now starting in 10-15% of the pilot units.

Process Model of School Cooperation

If the follow-up studies are correct, cooperation between educational establishments seems to be unfolding as a progression.

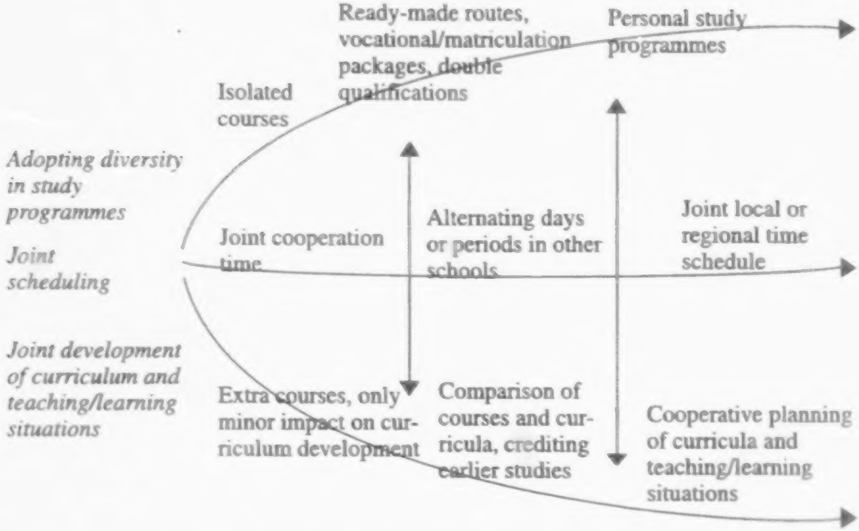
Ready-made routes, vocational/matriculation packages, double qualifications
Personal study programmes
Isolated courses
Adopting diversity in study programmes
Joint scheduling
Joint cooperation time
Alternating days or periods in other schools
Joint local or regional time schedule
Joint development of curriculum and teaching/learning situations
Extra courses, only minor impact on curriculum development
Comparison of courses and curricula, crediting earlier studies
Cooperative planning of curricula and teaching/learning situations

Figure 1. Process Model of School Cooperation (Numminen & al. 1997)

The process of development of the cooperation between academic and vocational institutions may be described as a three-phase model. The cooperation will need interdependent development in three major areas: introducing diversity into the study programmes, joint scheduling, and the joint development of the curriculum and of the teaching/learning methods.

In the first phase the schools will start opening their study options to the students also of other schools by offering isolated short courses. This will require a model of short scheduling, usually a few hours or half a day a week at a time. This phase will not influence the development of teaching/learning to any larger extent.

The second phase will be criticism of the fragmentary nature of isolated courses. As a result, the course options will be broadened by offering ready-made routes or "study packages" to students from other schools. This in turn will demand different models of scheduling, the solution apparently being sandwich-training with study days or periods at other schools. This phase is important from the point of view of curriculum development, for this is the first time that the teachers get acquainted with each other's curricula, as they compare the objectives and contents of courses.

The third phase is best described as a progression towards permitting the students themselves to form their personal study programmes. This phase will be facilitated by the fact that the large packages or double qualifications contained in the second phase already signify a considerable change and individualisation of the study programme of some of the students. The personal study programme requires a further broadening of the course options in all of the schools; as a result, open and flexible joint scheduling models combined with counselling and information systems are currently being developed. This phase will give further impetus to the discussion of a joint curriculum, emphasizing the further development of teaching and learning methods.

Conclusion

The follow-up studies of the upper secondary experiment have introduced a new knowledge and understanding of the schools networking and of the different school cultures (Arnman & al. 1995). Several practical solutions have been developed locally. The decentralised planning model of the experiment has proved successful.

The tentative process model of school cooperation that has been put forward reveals that the lessening of traditions and power structures of the schools, i.e. school cultures, is possible only in a processual manner and requires several years to become a reality. The students possibility of forming a personal, self-constructed study programme and the cooperative development of teaching and learning methods both call for practical solutions and a palpable change of attitude.

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CONCLUDING REMARKS

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Introduction

The purposes of international conferences like IVETA '97 and the motives of those who attend them are various. Because of this, their organizers attempt to construct programmes that meet diverse needs. The papers presented during such conferences are not necessarily chosen to fit some strictly defined common theme.

The nature of the present conclusion is determined by the purpose of the conference, offering the participants a broad range of opportunities for sharing thoughts on contemporary issues involved in vocational education and training in different parts of the world. Each presentation and its published summary is a whole in itself. The papers collected under a given theme form together a broad and many-sided perspective on their subject. The conclusion will first present some approaches used in different countries to organize and develop vocational education and training. Secondly I will suggest the reader a general conceptual framework that may help them in their reading of the publication.

Organizing Vocational Education and Training

The principles and practices observed in different countries in organizing vocational education and training are determined by their characteristic economic, cultural and social features and the way in which their occupational structures have evolved. Developing national cultures and promoting citizens' educational and cultural pursuits are the primary goals of education, though goals linked with economic growth have also been gaining prominence. Educational arrangements whose aim is to promote equality and protect the environment are also mentioned in educational policy papers. In emergent countries HRD issues, promoted through formal, informal and unformal education, are becoming important.

The rapid development of technology is the result of the process where human capital has become capable of mastering and controlling the environment. Economic and technological changes have contributed to a need to reform the structures and contents of vocational education. The concept of change and the principles of and programmes for its implementation and their practical outcomes are a recurrent subject in this decade's educational debates.

The point of departure for developing and reforming an educational system has often been the wish to raise the cultural and educational level of a nation and promote its economic growth. A successful reform of basic education has ensured that nearly all children receive education, citizen's educational level has risen and the number of those taking part in post-compulsory education has increased. After their basic education students often continue either in academic/general or vocational education or in education that combines both. This is what is known as the consecutive model, far from the only way of progressing through an educational system. It depends on the degree of flexibility built into a given system how far it allows students to move and switch the course of their studies in a horizontal direction. Even if the characteristic features of several countries' vocational education systems may be similar, the starting points of, motives behind and outcomes of their development are different.

In different countries and even within a single country vocational education and training has been organized in the most varied ways: there is school-based and work-based education, apprenticeship training and training in the form of courses. Vocational education may aim at occupational specialization, general labour market orientation, consumer and home economics as well as family education or involve the integration of vocational and academic curriculum. Goals and implementation methods depend on the age, needs and initial qualifications of the target group on the one hand, and on prevailing educational policy objectives on the other.

Educational services may be delivered by educational establishments and by the most diverse educational organizations, NGOs, enterprises and associations. Course-based training may be implemented in more varied ways and represent a more miscellaneous range of standards than longer-term education leading to certification. Vocational courses often narrowly focus on making those attending them employable, while training offered by the educational system aims at educational outcomes involving political, moral, intellectual and occupational development.

Vocational education and training that is integrated into the educational system is often delivered according to the consecutive model. The structure of vocational education comprises upper-secondary-level vocational schools and colleges together with polytechnics and technological colleges. Vocational students are offered school-, college- and tertiary-level qualifications. The vocational track draws different numbers of young people in different countries. In Taiwan and Finland, for example, as much as half or even more of the age group is in vocational education, while in some other countries it holds no attraction to the young. A perspective based on the consecutive model of vocational education is more problematic in considering countries where the goal is an education with a strong general education component. In such countries it is believed that the only way to teach key/core competencies is through liberal education.

The fact that unlike general/academic education, vocational education has not been arranged as a vertical hierarchy, has been felt as a problem on the systems level. To rectify this, many countries have revised their legislation and reformed their educational systems. A second problem has been that vocational school reforms may be steered by politicians and business leaders rather than by educators, educationalists and educational administrators. There are also differences between various countries in how closely their educational system links vocational education and training with labour market and social development policy.

Vocational education students may be offered a general education and trained in the management of their everyday life or/and directly prepared for entry into the labour market. In addition, the foci of national economies, such as concentrating on goods production and industry (e.g. Finland) or on marketing and selling goods and delivery of services (e.g. the USA.) influence vocational education strategies. The level of esteem enjoyed by vocational education and training in different countries may be seen in the degree to which it has been developed with public funds so far as to offer individuals entering vocational education a road to opportunity. Countries that have developed their educational systems in a vocational direction have aimed at the common good, believing that a developed vocational education system will also lead to increased equality and open individuals a broader range of further education options and career prospects.

Shared Issues

There are some shared issues in the educational discussion going on in industrialized countries. In the last few decades, the endeavour to create closer links between working life and education and between the economy and education has been a subject of debate and even an impetus to school reforms.

A perusal of the summaries of the papers presented at the IVETA 97 conference reveals the following topical subjects of analysis and comparison shared between the 23 countries represented at the conference: (1) the principles and concepts that guide educational and vocational education policies; (2) the structural development of vocational education; (3) epistemological questions involved in vocational learning; (4) contextual learning and learning at work; (5) developing and evaluating curricula; (6) human resources development, teacher training and teachers' professional development; and (7) global problems. Because the way in which such shared problems are outlined also depends on each writer's individual and cultural perspectives and because the above general outline is based on summaries of conference papers, I will here refrain from a more detailed analysis of the subject.

Another way to examine the contents offered at the conference is organizing their central subject areas into a vertical and horizontal grid. Along the vertical axis we may distinguish two ways of looking at the field, (1) guiding paradigms and (2) the labour market. Along the horizontal axis range three perspectives that may cross the previous categories: (3) general and/or vocational education policy, (4) developing curricula and (5) evaluation/assessment. I will not attempt to fill in this thematic and conceptual grid, proposing instead that those attending the conference and reading the publication adopt it as their homework.

LOPPUPÄÄTELMÄT

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IVETA '97:n kaltaisten kansainvälisten kongressien tarkoitukset ja niihin osallistumisen motiivit ovat moninaiset. Sen vuoksi kongressien ohjelmat pyritään rakentamaan siten, että ne vastaavat monenlaisiin tarpeisiin. Niiden esitelmiä ei välttämättä koota minkään sisällöllisesti tiukan yhteisen teeman mukaan.

Tämän yhteenvedon luonne määräytyy IVETA '97 -kongressin tarkoituksesta tarjota osallistujille monipuolisia tilaisuuksia vaihtaa ajatuksia ammatillisen koulutuksen nykyhetken ongelmista sellaisina kuin ne ilmenevät eri puolilla maailmaa. Jokainen esitelmä ja sen julkaistu yhteenveto on kokonaisuus sinänsä. Tietyn teeman alle kootut esitelmät muodostavat yhdessä laajan ja monipuolisen näkökulman aiheeseensa. Kokonaisyhteenvedon tarkoituksena on ensinnäkin esitellä muutamia lähestymistapoja, joiden kautta ammatillista koulutusta on järjestetty ja kehitetty eri maissa. Toiseksi ehdotan lukijalle yleistä käsitekehikkoa, joka voi olla avuksi julkaisua lukiessa.

Ammattikoulutuksen ja -kasvatuksen järjestäminen

Eri maissa noudatettavat ammattikoulutuksen järjestämisen periaatteet ja käytännöt määräytyvät kunkin maan taloudellisista, kulttuurisista ja sosiaalisista ominaispiirteistä sekä sen elinkeinorakenteen syntyhistoriasta käsin. Koulutuksen ensisijainen tehtävä on kansallisten kulttuurien kehittäminen ja kansalaisten sivistyspyrkimysten edistäminen, vaikka talouskasvuun liittyvät tavoitteet ovatkin korostuneet. Myös tasa-arvon edistämiseen ja ympäristösuojeluun tähtäävät koulutukselliset ratkaisut esiintyvät koulutuspoliittisissa selvityksissä. Kehitysmaissa nousevat tärkeiksi inhimillisten voimavarojen kehittämiseen liittyvät kysymykset ja niiden ratkaiseminen muodollisen, epämuodollisen (formal / informal education) ja satunnaisen kurssimuotoisen koulutuksen (unformal education) avulla.

Teknologian nopea kehitys on tulosta inhimillisen pääoman kehittymisestä ympäristön hallitsemiseen ja kontrolloimiseen. Taloudelliset ja tekniset muutokset ovat myötävaikuttaneet tarpeeseen muuttaa ammattikoulutuksen rakenteita ja sisältöjä. Tämän vuosikymmenen koulutuskeskusteluissa esiintyy käsite muutos ja sen toteuttamisperiaatteet ja -ohjelmat sekä kysymys niiden toimivuudesta käytännössä.

Koulutusjärjestelmän kehittämisen ja uudistamisen lähtökohtana on usein ollut kansakunnan sivistyksen ja koulutuksen tason nostaminen sekä talouskasvu. Peruskoulutuksen uudistamisen onnistuminen on taannut sen, että lähes kaikki lapset on saatu koulutuksen piiriin, kansalaisten koulutustaso on noussut ja peruskoulun jälkeiseen koulutukseen osallistuvien määrä on kasvanut. Peruskoulun jälkeen opiskelijat usein jatkavat joko yleissivistävissä tai ammatillisissa oppilaitoksissa tai niitä yhdistävässä koulutuksessa. Tämä on ns. peräkkäismalli, joka ei ole suinkaan ainoa tapa jäsentää koulutuksen kulku. Koulutusjärjestelmien joustavuudesta riippuu, miten ne sallivat siirtymisiä ja opintojen suunnan vaihtamista horisontaalisessa suunnassa. Vaikka useiden maiden ammatillisen koulutuksen piirteet voivat muistuttaa toisiaan, niiden kehittämisen lähtökohdat ja motiivit ja saavutetut tulokset poikkeavat toisistaan.

Ammattikasvatus ja -koulutus on eri maissa tai jopa yhdenkin maan sisällä järjestetty monilla eri tavoin: on koulupohjaista, työpaikoilla tapahtuvaa, oppisopimus- ja kurssimuotoista koulutusta. Ammatillisen koulutuksen tavoitteena voi olla ammatillinen erikoistaminen, yleinen työmarkkinoihin perehdyttäminen, kulutus- sekä kotitalous- ja perhekasvatustietouden jakaminen sekä ammatillisen ja akateemisen opetussuunnitelman integrointi. Tavoitteet ja toteuttamistavat riippuvat toisaalta koulutettavan kohderyhmän iästä, tarpeista ja lähtötasosta ja toisaalta vallitsevista koulutuspoliittisista päämääristä.

Koulutuspalveluja voivat tarjota oppilaitokset ja mitä erilaisimmat koulutusorganisaatiot, kansalaisjärjestöt, yritykset ja liitot. Kurssimuotoinen koulutus voi olla toteutukseltaan ja laadultaan paljon kirjavampaa kuin pitkäjänteisempi ammattitutkintoon johtava koulutus. Ammatillinen kurssitus tähtää usein kapea-alaisesti koulutettavien työllistämiseen, kun taas koulutusjärjestelmän sisällä tapahtuvaa koulutusta ohjaavat poliittiset, moraaliset, älylliset ja ammatilliset kasvatuspäämäärät.

Koulutusjärjestelmän osana annettava ammatillinen koulutus toteutetaan usein peräkkäismallin mukaan. Ammattikoulutuksen rakenteeseen kuuluvat ylemmän keskiasteen ammattikoulut ja -opistot sekä ammattikorkeakoulut ja teknologiakorkeakoulut. Ammatilliset tutkinnot ovat koulu-, opisto- ja korkeakoulutasoisia. Ammattikasvatus houkuttelee nuoria eri tavalla eri maissa. Esimerkiksi Taiwanissa ja Suomessa ammatillinen koulutus on vetänyt piiriinsä jopa puolet tai suuremmankin osan ikäryhmästä, kun taas joissakin maissa nuoret vieroksuvat ammattikoukutusta. Ammatillisen koulutuksen peräkkäismalli on ongelmallisempi lähestymistapa tutkittaessa maita, joissa pyrkimyksenä on vahvasti yleissivistävä koulutus. Näissä maissa uskotaan, että ammatillisia perusvalmiuksia voidaan opettaa vain yleissivistävän koulutuksen avulla.

Ammatillisen koulutuksen ongelmaksi järjestelmätasolla on koettu se, ettei sitä ole organisoitu vertikaaliseksi hierarkiaksi kuten yleissivistävää koulutusta. Monissa maissa on sen takia uudistettu lainsäädäntöä ja koulutusjärjestelmää. Toinen ongelma on ollut se, että ammattikasvatuksen uudistaminen on saattanut olla pikemmin poliitikkojen ja liike-elämän johdon kuin kasvatusalan edustajien käsissä. Eri maiden välillä on myös eroja siinä, missä määrin ammattikoulutus on koulutusjärjestelmän kautta nivoutunut työmarkkina- ja yhteiskuntapolitiikkaan.

Ammattikoulutus voi olla luonteeltaan yleissivistävää ja arkielämän hallintaan tähtäävää tai/ja suoraan työmarkkinoille valmistavaa. Sen ohella ammatillisen koulutuksen strategioihin vaikuttavat kunkin maan elinkeinoelämän painopisteet, kuten esimerkiksi keskittyminen joko tavarantuotantoon ja teollisuuteen (esim. Suomi, Taiwan) tai tavaroitten markkinoimiseen, myymiseen ja palveluihin (esim. Yhdysvallat). Se, miten paljon eri maissa arvostetaan ammattikasvatusta, näkyy osaltaan siitä, missä määrin sitä on kehitetty yhteisillä varoilla niin pitkälle, että ammatillinen koulutus tarjoaa yksilölle väylän menestykseen. Maissa, joissa koulutusjärjestelmää on kehitetty ammatillisen orientaation suuntaan, on lähdetty yhteisen hyvän tavoittelusta. On uskottu, että kehittynyt ammatillinen koulutusjärjestelmä lisää myös tasa-arvoa ja laajentaa yksilöiden mahdollisuuksia suorittaa jatko-opintoja ja edetä urallaan.

Yhteisiä kysymyksiä

Teollisuusmaiden koulutuskeskustelussa esiintyy muutamia yhteisiä teemoja. Työelämän ja koulutuksen sekä talouden ja koulutuksen välisten yhteyksien lähentäminen on viime vuosikymmeninä ollut pohdinnan kohteena ja jopa koulunuudistusten alulle panevana voimana.

IVETA '97 -kongressin yhteenvedoista nousee esiin seuraavanlaisia kongressissa edustettuina oleville 23 maalle yhteisiä ajankohtaisia analyysi- ja vertailukohteita: (1) koulutuspolitiikkaa ja ammattikoulutuspolitiikkaa ohjaavat periaatteet ja käsitteet; (2) ammattikoulutuksen rakenteellinen kehittäminen; (3) ammatilliseen oppimiseen liittyvät epistemologiset kysymykset; (4) kontekstuaalinen ja työssä oppiminen; (5) opetussuunnitelmien kehittäminen ja arviointi; (6) asiantuntija- ja opettajakoulutus; ja (7) globaalit ongelmat. Koska se, miten yhteiset ongelmat hahmotetaan, on myös kirjoittaja- ja kulttuurikohtainen asia, ja koska tämän yhteenvedon pohjana ovat kongressin esitelmät, aihepiiriä ei tässä eritellä tarkemmin.

Toinen mahdollinen tapa tarkastella kongressin sisällöllistä antia on jäsentää esitelmien keskeiset teema-alueet vertikaali-horisontaalitauluksi. Vertikaalisella akselilla voidaan erottaa kaksi näkökulmaa: (1) koulutus- ja ammattikoulutuspoliittiset paradigmat ja (2) työmarkkinat. Horisontaalisella akselilla on kolme ehkä edellisten perspektiivien kanssa ristikkäistä tarkastelukulmaa: (3) yleinen ja/tai ammattikoulutuspolitiikka, (4) opetussuunnitelmien kehittäminen ja (5) opetuksen ja oppimisen arviointi. Näitä teema- ja käsitekehikkoja ei ole tässä tarkoituskaan kehittää lopulliseen muotoon, vaan jätän niiden täydentämisen kotiläksyksi kongressin osallistujille ja julkaisun lukijoille.

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Eija Pehu, Professor at the University of Helsinki; President of a women's owned and run international consultancy company based in Helsinki. She was awarded her Ph.D degree in 1986. Her career is featured by a strong dual professional interest, one on gender in international development and one on agricultural and biotechnological research. In 1986 Eija Pehu joined an FAO field project in Sudan for two years followed by a post-doctoral research period at Rothamsted Experimental Station in the UK. In 1987 together with another colleague founded Widagri Consultants Ltd. The main trust of the company is to provide expertise in gender dimension and empowerment processes for women mainly in developing countries and lately also in industrialized countries. The company has conducted over 70 assignments since 1987, mainly in Africa. Widagri Consultants Ltd. has also been instrumental in assisting various organizations in their gender policy formulation.

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Tain-Fung Wu took his Ph.D. in Industrial Education at the University of Missouri-Columbia in 1994. He has worked as a Design Engineer in the Unique Architect and Engineer (1967 - 1971) and as a full-time instructor in the Department of Mechanics of Taiwan Provincial Industrial-Vocational Changhua Senior High School (1973 - 1974). In 1974 he was engaged as an Assistant and Instructor by the Department of Industrial Education of the National Changhua University of Education, becoming Associate Professor in 1984. He has also been employed as consultant by China Productivity Center (1987 - 1990).

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Professor Michael Young's research interests include curriculum issues in secondary and post-secondary education and their links to technological developments and changes in world economies. He has been a governor of a secondary school and Chair of Governors of a Further Education College. Recently he has been consultant to OECD and the UNESCO Centre for Educational Policy Development in South Africa. He is Co-Director (with John Woolhouse, University of Warwick) of the Learning for the Future Project and Director of the Hamlyn Post-16 Unified Curriculum Project. He has completed two evaluations of reforms in upper secondary education in Finland.

His recent publications include *A British Baccalauréat* (Co-author, IPPR, 1990); "A curriculum for the 21st century: Towards a new basis for overcoming academic/vocational divisions", *British Journal of Educational Studies*, 1993; "Modularisation and outcomes: Towards a strategy for unifying the post-16 curriculum" in J. Burke, (Ed.), *Outcomes and the Curriculum* (Falmer 1995); and "Post-compulsory education for a learning society", *Australian Journal of Vocational Education*, Spring 1995; (with Tom Leney and Ann Hodgson) *Overcoming academic/vocational divisions: Lessons from Scotland and France* (Post-16 Centre Working Paper, Jan 1995).

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IVETA '97 CONFERENCE PROGRAMME

The Challenges of the 21st Century for Vocational Education and Training

INTERNATIONAL CONFERENCE ON
VOCATIONAL EDUCATION AND TRAINING

August 24-28, 1997
Helsinki, Finland

Organizer:

THE UNION OF VOCATIONAL PRINCIPAL ASSOCIATIONS
IN FINLAND

Saturday, August 23

3.30 pm -	IVETA Executive Committee Meeting Lobby of Intercontinental Hotel

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Sunday, August 24

9 am - 12 am	Tennis and Golf Tournament
12 am - 7 pm	Registration at Helsinki IV College for Health Care Professionals, Vanha viertotie 23
10 am - 1 pm	IVETA Executive Committee Meeting Helsinki IV College for Health Care Professionals, Vanha viertotie 23
4 pm - 6 pm	Helsinki Sightseeing Tour Departure at Helsinki IV College for Health Care Professionals, Vanha viertotie 23
7 pm -	Get Together -Party Helsinki IV College for Health Care Professionals, Vanha viertotie 23

Monday, August 25

	Congress Halls A and B
9 am - 11 am	Opening Ceremonies at the Finlandia Hall
11 am - 1 pm	Lunch
1 pm - 3 pm	**KEYNOTES** on
	The Challenges of the 21st Century for Vocational Education and Training from the Global, National and Regional Perspectives
1 pm - 1.30 pm	Challenges of the 21st Century for Technical-Vocational Education and Training from Global, Regional and National Perspectives
	Basu, Chiranjib Kumar, Dr., Director of Colombo Plan Staff College for Technician Education, Philippines

1.30 pm - 2 pm	The Challenges of the 21st Century for Vocational Education and Training from Global, National and Regional Perspectives *Ducci, Maria A.*, Chief of ILO Training Policies and Systems Branch, Geneva, Switzerland
2 pm - 2.30 pm	A Vision of Vocational Education and Training for the Approaching Millennium *Mndebele, Comfort B. S.*, Dr., Vocational & Agricultural Education, University of Swaziland Chair: *Decker-Mathews, Jean*, President of IVETA, International Labor Office, Washington D.C., USA Facilitator: *Lahti, Leila*, Principal, Helsinki Polytechnic, Helsinki IV College for Health Care Professionals, Finland

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3 pm - 5 pm	**PARALLEL SESSIONS**
	Room 21
Session A	**Global Perspective**
Topic 1:	Vocational Education and Training Projects in Developing Countries - Issues of Quality and Sustainability
3 pm - 3.30 pm	*Herschbach, Dennis R.*, Associate Professor, Department of Policy, Planning and Administration, College of Education, University of Maryland, MD, USA
Topic 2:	The Link between Education and Training and Economic Growth: The Distinctive Experience of the 'Tiger' Economies of the Pacific Rim
3.30 pm - 4 pm	*Ashton, David N*, Professor, Director of the Centre for Labour Market Studies, University of Leicester, England *James, Donna*, Research Associate, The School of Business and Economic Studies, University of Leeds, England *Sung, Johnny*, Deputy Director, Centre for Labour Market Studies, University of Leicester, England
Topic 3:	Global Trends in the Workplace: Impressions of Workforce Education Systems
4 pm - 4.30 pm	*Farmer, Edgar I.*, Dr., Workforce Education & Development, The Pennsylvania State University, PA, USA

Topic 4:	Environmental Education for Sustainability
4.30 pm - 5 pm	*Parkin, Christopher*, Dr., Further Education Development Agency (FEDA), England *Lawrence, Allan*, Dr., International Officer, Hopwood Hall College, England
	Chair: *Lampinen, Osmo*, Dr., The Finnish Ministry of Education, Finland Facilitator: *Peltosaari, Leena*, Principal, The College for Teachers of Home Economics in Järvenpää, Finland

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	Room 22
Session B	**Innovating Vocational and Technical Education**
Topic 1:	Intersectoral Approach to Literacy and VET: The Case of the Sudan
3 pm - 3.30 pm	*Washi, Sidiga A. Rahim*, Assistant Professor, College of Agriculture, King Saud University, Kingdom of Saudi Arabia
Topic 2:	The Business Incubation Concept: Global Possibilities for Vocational-Technical Education
3.30 pm - 4 pm	*Hernández-Gantes, Victor M.*, Dr., School of Education, University of Wisconsin-Madison, WI, USA
Topic 3:	Banking Education and Training in Hong Kong: A Profile and Its Challenges in the 21st Century
4 pm - 4.30 pm	*Ho, Lai Fong*, Senior Lecturer, Division of Commerce, City University of Hong Kong, Hong Kong
Topic 4:	Students' Motives for Making Study Choices with Increased Freedom in Constructing Their Study Programs
4.30 pm - 5 pm	*Mäkinen, Raimo*, Dr., Institute for Educational Research, University of Jyväskylä, Finland *Vuorinen, Päivi*, Researcher, Institute for Educational Research, University of Jyväskylä, Finland
	Chair: *Daines, Jeanette*, Dr., Academic Program Director, Minnesota State Colleges and Universities, MN, USA Facilitator: *Mattila, Paula*, Project Manager of International Affairs, Espoo-Vantaa Polytechnic, Finland

	Room 23
Session C	**Learning as a Challenge**
Topic 1:	Student Learning in Vocational Education - An Epistemological Problem?
3 pm - 3.30 pm	*Liljefelt, Owe*, PhLic., Department of Special Education, Stockholm Institute of Education, Sweden
Topic 2:	The Expert Learners Workshops Project
3.30 pm - 4 pm	*Corrigan, Paul C.*, Lecturer, College of Higher Vocational Studies, City University of Hong Kong, Hong Kong *Lee, Pauline*, Senior Lecturer, College of Higher Vocational Studies, City University of Hong Kong, Hong Kong
Topic 3:	A Customer Oriented Approach for Curriculum Development in Vocational Education
4 pm - 4.30 pm	*Chao, Chih-Yang*, Associate Professor, Department of Industrial Education, National Changhua University of Education, Taiwan, Republic of China
Topic 4:	Vocational Course/Program Evaluation
4.30 pm - 5 pm	*Campbell, Clifton P.*, Professor, Department of Human Resource Development, the University of Tennessee, Tenn, USA
	Chair: *Valkonen, Aki*, Dr., President of Helsinki Business Polytechnic, Finland Facilitator: *Kuurne, Pirkko*, International Coordinator, Helsinki Polytechnic, Finland

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	Room 24
Session D	**Global Economy and Educational Reforms Developing Vocational and Technical Education and Training**
Topic 1:	The Challenges of the 21st Century for Vocational-Technical Education in Taiwan, Republic of China
3 pm - 3.30 pm	*Wu, T. Y. Robert*, Professor, Department of Industrial Education, National Changhua University of Education, Taiwan, Republic of China

Topic 2: The Challenge for Vocational Education and Training in Hong Kong as Part of the "One Country Two Systems" Philosophy

3.30 pm - 4 pm *Boardman, Derek,* Dr., Vice Principal, Vocational Training Council, Hong Kong Technical College, Hong Kong

Topic 3: New Designs for the Two-Year Institution of Higher Education: Implications for Vocational Education and Training

4 pm - 4.30 pm *Copa, George H.,* Professor, Leadership Academy for Two-Year Institutions of Higher Education, University of Minnesota, MN, USA
Ammentorp, William, Professor, Leadership Academy for Two-Year Institutions of Higher Education, University of Minnesota, MN, USA
Jilk, Bruce, Educational Planner and Architect, Hammel, Green and Abrahamson, Inc., MN, USA

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Facilitator: *Narko, Riitta,* Vice Principal, The College for Teachers of Home Economics in Järvenpää, Finland

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Congress Halls A and B

Session E **Symposium on** Finding New Strategies for Post-16 Education to Promote Parity of Esteem between Vocational and General/Academic Education by Networking in Seven European Countries

3 pm - 3.10 pm **Introduction of Post-16 Strategies Project**

Lasonen, Johanna, Dr., Institute for Educational Research, University of Jyväskylä, Finland

3.10 pm - 3.30 pm **Enhancing Vocational Programmes**

Birke, Barbara, Researcher, Institute for Industrial Research, Vienna University, Austria
Blumberger, Walter, Dr., Managing Director of Institute for Educational and Vocational Research, University of Linz, Austria
Heidegger, Gerald, Professor, Institute for Technology and Education, University of Bremen, Germany
Bremer, Rainer, Dr., Institute for Technology and Education, University of Bremen, Germany

3.30 pm - 3.50 pm **Mutual Enrichment of Vocational and General Education**

Njerve, Ivar, Associate Professor, Faculty of Education, Agder College, Norway
Virolainen, Maarit, Researcher, Institute for Educational Research, University of Jyväskylä, Finland

3.50 pm - 4.10 pm **Linkages between General/Academic and Vocational Education**

Lazar, Anne, Dr., Department of Didactics, International Centre for Pedagogical Studies, France
Levrat, René, Project Manager, International Centre for Pedagogical Studies, France
Spours, Ken, Research Officer, Post-16 Education Centre, Institute of Education, University of London, England
Young, Michael, Professor, Post-16 Education Centre, Institute of Education, University of London, England

4.10 pm - 4.30 pm **Unifying General and Vocational Education**

Arnman, Göran, Dr., Director of Education, National Agency for Education, Sweden
Raffe, David, Professor, Centre for Educational Sociology, University of Edinburgh, Scotland

4.30 pm - 4.40 pm **Comparisons of European Post-16 Education Strategies**

Lasonen, Johanna, Dr., Institute for Educational Research, University of Jyväskylä, Finland

4.40 pm - 5 pm Discussants:
Poropudas, Olli, Senior Advisor, The Finnish Ministry of Education, Finland
Manning, Sabine, Dr., Research Forum, WIFO, Germany

Chair: *Kämäräinen, Pekka*, Project Coordinator, European Centre for the Development of Vocational Training (CEDEFOP), Thessaloniki, Greece
Facilitator: *Laanti, Marja*, Vice Principal, Helsinki Polytechnic, College of Midwifery and Nursing, Finland

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Free Evening

Tuesday, August 26

9 am - 11 am **KEYNOTES** on

Interrelationships between the Role and Responsibilities of Working Life and Vocational Education and Training

Congress Halls A and B

9 am - 9.15 am Chair's Notice

Rauhala, Pentti, Dr., IVETA '97 Programme Chair, President of the Union of Vocational Principal Associations in Finland, President of Espoo-Vantaa Polytechnic, Finland

9.15 am - 9.45 am Opportunities for Knowledge-Based Cooperation and Collaboration in Technical and Vocational Education between Europe and Asia Pacific

Ngui, Matt, Project Manager, Centre for Research Policy, University of Wollongong, Australia

9.45 am - 10.15 am Joint Venture Partnerships between Vocational Education and Training, and Businesses

Campbell, Clifton P., Professor, Department of Human Resource Development, the University of Tennessee, Tenn, USA

10.15 am - 10.45 am *Bildung* through Vocational Education

Volanen, Matti Vesa, Senior Researcher, Institute for Educational Research, University of Jyväskylä, Finland

Chair: *Lasonen, Johanna,* Dr., President-Elect of IVETA, Institute for Educational Research, University of Jyväskylä, Finland
Facilitator: *Mustonen, Marja-Liisa,* Institute for Educational Research, University of Jyväskylä, Finland

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11 am - 1 pm Lunch

11.30 am - 12.30 pm IVETA Executive Committee Meeting
Room

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1 pm - 3 pm **KEYNOTES on**

Opportunities to Enrich Vocational Education and Skills Training through Applications of the Philosophy and Methods of Adult Education

Congress Halls A and B

1 pm - 1.30 pm Shaping the Work Life - A Future Oriented Way of Lifelong Learning

Heidegger, Gerald, Professor, Institute Technology and Education, University of Bremen, Germany

1.30 pm - 2 pm Opportunities to Enrich Vocational Education and Skills Training through Applications of the Philosophy and Methods of Adult Education

Ollila, Maija-Riitta, Dr., University of Helsinki, Finland

2 pm - 2.30 pm Adult Learning in the Vocational Education Context - Issues of Destinations and Journeys

Bellis, Ian, Professor, Human Resource Development, Rand Afrikaans University, South Africa

Chair: *Dunham, Daniel*, Professor Emeritus, Executive Director of IVETA, School of Education, Oregon State University, Ore, USA
Facilitator: *Kosonen, Tuulikki*, Principal, Heinola Institute of Arts and Crafts, Finland

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3 pm - 5 pm **PARALLEL SESSIONS**

Theme: **Interrelationships between the Role and Responsibilities of Working Life and Vocational Education and Training**

Room 21

Session A **Development of Vocational Education and Training Programmes**

Topic 1: A Study on the Feasibility of the Ten-Year Compulsory Education Program in Central Taiwan, Republic of China

3 pm - 3.30 pm	*Wu, Tain-Fung*, Dr., Department of Industrial Education, National Changhua University of Education, Taiwan, Republic of China
Topic 2:	Jobs in the 21st Century, Are Labor Market Needs Changing?
3.30 pm - 4 pm	*Redovich, Dennis*, Dr., Director of the Center for the Study of Jobs & Education in Wisconsin, WI, USA
Topic 3:	An Evaluation of the Reform of Finnish Upper Secondary Vocational Education Curriculum: The Perspective of Individualization and Personally Constructed Study Programmes
4 pm - 4.30 pm	*Stenström, Marja-Leena*, Senior Researcher, Institute for Educational Research, University of Jyväskylä, Finland
	Chair: *Mikkonen, Annikki*, Principal, Jyväskylä Polytechnic, Finland Facilitator: *Narko, Riitta*, Vice Principal, The College for Teachers of Home Economics in Järvenpää, Finland

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Room 22

Session B	**Contextual Learning**
Topic 1:	Curriculum Renewal of Chemical Engineer by Job Analysis in Korea
3 pm - 3.30 pm	*Kim, Pan Wook*, Professor, Department of Industrial Technology, Chungnam National University, Korea *Park, So Jin*, Associate Professor, Department of Chemical Engineering, Chungnam National University, Korea
Topic 2:	The Challenge of Functional Foreign-Language Literacy: How to Develop Reading-to-Do Instruction in Engineering Education
3.30 pm - 4 pm	*son, Esko*, PhLic., Kokkola Institute of Technology, Central obothnia Polytechnic, Finland
Topic 3:	Training Needs in Entrepreneurial Leadership for Women - Cases from North and South
4 pm - 4.30 pm	*Avotie, Leena*, Instructor, Department of Business Administration, Uppsala University, Sweden

Pehu, Eija, Director of Widagri Consultants Ltd., Professor of Agronomy, University of Helsinki, Finland
Lasonen, Johanna, Dr., Institute for Educational Research, University of Jyväskylä, Finland

Chair: *Kuurne, Pirkko*, International Coordinator, Helsinki IV College for Health Care Professionals, Helsinki Polytechnic, Finland
Facilitator: *Ilomäki, Risto*, Principal, Tampere Vocational Schools, Finland

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Congress Halls A and B

Session C **Symposium on** Qualifications with a Dual Orientation for Skilled Work and Studies - Innovative Schemes of Seven European Countries under Investigation

3 pm - 3.20 pm **Survey: Innovative Schemes of Dual Qualification in Comparison**

Manning, Sabine, Dr., Research Forum WIFO, Berlin, Germany

3.20 pm - 3.40 pm **Issue 1: Integrated Learning Process**

Larsen, Lillian, Senior Lecturer, Department of Education for Vocational and Technical Teachers, Akershus College, Norway
Liljefelt Owe, PhLic., Stockholm Institute of Education, Sweden

3.40 pm - 4 pm **Issue 2: Supporting Transitions to Higher Education**

Brown, Alan, Dr., Institute for Employment Research (IER), University of Warwick, England
Moerkamp, Trudy, SCO-Kohnstamm Institute, University of Amsterdam, The Netherlands

4 pm - 4.20 pm **Issue 3: Tracing Careers**

Kusch, Werner, Dr., Staatsinstitut für Schulpädagogik und Bildungforschung (ISB), Munich, Germany

4.20 pm - 4.40 pm **Outlook: Potential for Collaborative Research under Leonardo**

Manning Sabine, Dr., Research Forum WIFO, Berlin, Germany

4.40 pm - 5 pm Discussant: *Välijärvi, Jouni*, Professor, Institute for Educational Research, University of Jyväskylä, Finland

	Chair: *Kämäräinen, Pekka,* Project Coordinator, European Centre for the Development of Vocational Training (CEDEFOP), Thessaloniki, Greece Facilitator: *Peltosaari, Leena,* Principal, The College for Teachers of Home Economics in Järvenpää, Finland
3 pm - 5 pm	**PARALLEL SESSIONS**
Theme:	**Opportunities to Enrich Vocational Education and Skills Training through Applications of the Philosophy and Methods of Adult Education**
	Room 23
Session D	**Professional Development**
Topic 1:	Teachers' Contributions to and Involvement in School-to-Work Transition
3 pm - 3.30	*Schmidt, B. June,* Professor, Project Director, National Center for Research in Vocational Education, VA, USA *Finch, Curtis R.,* Professor, Director of National Center for Research in Vocational Education, College of Human Resources, Virginia Polytechnic Institute and State University, VA, USA
Topic 2:	Evaluation of the Professional Teachers - The Requirements for a Nurse Teacher
3.30 pm - 4 pm	*Salminen, Leena,* Senior Lecturer, Department of Nursing, University of Turku, Finland *Leino-Kilpi, Helena,* Dr., Department of Nursing, University of Turku, Finland
Topic 3:	A Study on the Trends of Vocational Advanced Extension Education in Taiwan, Republic of China
4 pm - 4.30 pm	*Rau, Dar-Chin,* Dr., Technological and Vocational Education Research Center, National Taiwan Normal University, Taiwan, Republic of China *Chiang, Ming-Chung,* Dr., Technological and Vocational Education Research Center, National Taiwan Normal University, Taiwan, Republic of China
Topic 4:	Research Development and the Challenges of the 21st Century for Vocational Education and Training

4.30 pm - 5 pm	*Hardy, Marcelle*, Dr., Department of Education, Université du Québec á Montreal, Canada
	Chair: *Daines, Jeanette*, Dr., Academic Program Director, Minnesota State Colleges and Universities, MN, USA Facilitator: *Douthwaite, Tyyri*, International Coordinator, Espoo Business College, Finland

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	Room 24
Session E	**Issues of Quality Process**
Topic 1:	Quality Process of Adult Vocational Training
3 pm - 3.30 pm	*Niemegeerts, Guy*, Consultant, Department Human Resources International, EDF GDF, France
Topic 2:	Training Upper Secondary School Teachers: The Combined Initial Teacher Education Experiment of Agder College
3.30 pm - 4 pm	*Njerve, Ivar*, Associate Professor, Faculty of Education, Agder College, Norway *Sandvik, Ove*, Director, Teacher Practice, Section for Teacher Education, Agder College, Norway
Topic 3:	The Core Curriculum of Mechatronics for Industrial Vocational Teacher Education in Taiwan
4 pm - 4.30 pm	*Hsiao, Hsi-Chi,,* Professor, Department of Industrial Education, National Changhua University of Education, Taiwan, Republic of China *Huang, Yue Wei*, Professor, Department of Industrial Education, National Changhua University of Education, Taiwan, Republic of China *Kang Tze-Li*, Professor, Department of Industrial Education, National Changhua University of Education, Taiwan, Republic of China *Wu, Menq-Jiun*, Associate Professor, Department of Industrial Education, National Changhua University of Education, Taiwan, Republic of China *Chen, Shyi-Jen*, Graduate Student, Department of Industrial Education, National Changhua University of Education, Taiwan, Republic of China *Chang, Jen-Chia*, Graduate Student, Department of Industrial Education, National Changhua University of Education, Taiwan, Republic of China

Chair:
Facilitator: *Kantonen, Markku,* Principal, Vocational Adult Education Centre, Finland

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7 pm - Evening Program: Dinner Cruise on the Royal Line Ship "Natalie" in the Helsinki Archipelago

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Wednesday, August 27

9 am - 11 am **KEYNOTES** on

Implementing National Standards and Qualifications: Implications for the International Labour Market

Congress Halls A and B

9 am - 9.30 am Do Joint European Vocational Training Standards Stand a Chance? Recognition and Transparency of Qualifications

Sellin, Burkart, Dr., European Centre for the Development of Vocational Training (CEDEFOP), Thessaloniki, Greece

9.30 am - 10 am Review and Preview of Higher Vocational Education: Changes in Hong Kong and International Trends

Imrie, Bradford William, Dr., Director of Professional Development & Quality Services, City University of Hong Kong, Hong Kong

10 am - 10.30 am Implementation of National Standards for the International Labor Market

Hull, Daniel M., President and CEO of Center for Occupational Research and Development (CORD), Tex, USA
Matthews, Anne L., Dr., State Department of Education, SC, USA

Chair: *Niven, Stuart,* President Emeritus, Director, Scottish School of Education, University of Strathclyde, Scotland
Facilitator: *Railimo-Saares, Leena,* International Coordinator, Espoo College of Health Care and Social Welfare, Finland

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11 am - 1 pm	Lunch
11.30 am - 12.30 pm	IVETA Executive Committee Meeting Room

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1 pm - 3 pm	**KEYNOTES** on
	Networks as Resources for Vocational Education and Training
	Congress Halls A and B
1 pm - 1.30 pm	International Networks as Resources for Vocational Education and Training
	Dunham, Daniel, Professor Emeritus, Executive Director of IVETA, School of Education, Oregon State University, Ore, USA
1.30 pm - 2 pm	The Need for Strategic Alliances-Networks in VET
	Hollanders, Jan Willem, President of European Forum of Technical and Vocational Education and Training (EFVET), The Netherlands
2 pm - 2.30 pm	Network-Based Flexible Learning: Prospects and Challenges in 21st Century
	Majumdar, Shyamal, Professor, Technical Teachers' Training Institute, India *Manoj, Das,* Lecturer, Technical Teachers' Training Institute, India
	Chair: *Leila, Lahti,* Vice President of the Union of Vocational Principal Associations in Finland, Principal, Helsinki IV College for Health Care Professionals, Helsinki Polytechnic, Finland Facilitator: *Koskinen, Kaija,* Lecturer, Kerava Business College, Finland

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3 pm - 4 pm	**PARALLEL SESSIONS**
Theme:	**Implementing National Standards and Qualifications: Implications for the International Labour Market**
	Room 21

Session A	**Applications of National Standards**
Topic 1:	United States National Family and Consumer Sciences Standards Project
3 pm - 3.30 pm	*Border, Barbara*, National Standards Project Director, Education Leadership, Vocational-Technical Education Consortium of States, AZ, USA *Dillon, Nancy F.*, States Tech-Prep and Hospitality Director, State Board of Community Colleges, AZ, USA
Topic 2:	Approaches to Improving the Senior-Vocational-School Textbooks Review-and-Approval Process in Taiwan
3.30 pm - 4 pm	*Lai, Chun-Chin*, Dr., Department Head, National Institute for Compilation and Translation, Ministry of Education, Taiwan, Republic of China
	Chair: *Daines, Jim*, Dr., Daines Associates, MN, USA Facilitator: *Moua, Lea*, International Coordinator, Helsinki Polytechnic, Helsinki IV College for Health Care Professionals, Finland

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	Room 22
Session B	**A Case Developing VET through International Resources**
Topic 1:	Education Resource Centers: A New Approach to the Professional Development of Educators in the Republic of Türkiye (Turkey)
3 pm - 3.30 pm	*Kraska, Marie F*, Associate Professor, Department of Vocational and Adult Education, Auburn University, Ala, USA
Topic 2:	Vocational and Technical Education Projects in Türkiye
3.30 pm - 4 pm	*Gürbüz, Riza*, Dr., Çankiri College of Arts and Technology, Ankara University, Turkey *Balci, Sabahattin*, Professor, Principal, Çankiri College of Arts and Technology, Ankara University, Turkey
	Chair: *Valkonen, Aki*, Dr., President of Helsinki Business Polytechnic, Finland Facilitator: *Havukainen, Pirjo*, Lecturer, International Coordinator, Espoo-Vantaa Polytechnic, Finland

3 pm - 4 pm	**PARALLEL SESSIONS**
Theme:	**Networks as Resources for Vocational Education and Training**
	Room 23
Session C	**Network-Based Learning**
Topic 1:	Nursing Student Information Network: Fostering Tutorial Communications Using an Electronic Mail List
3 pm - 3.30 pm	*Saranto, Kaija,* Lecturer, Porvoo College of Nursing, Finland
	Chair: *Haapanen Eija,* Director, Vantaa Institute for Continuing Education, University of Helsinki, Finland Facilitator: *Sarvilahti, Outi,* Principal, Etelä-Karjala Polytechnic, Finland

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	Room 24
Session D	**International Comparisons**
Topic 1:	A Comparison of Occupational Programs in the Comprehensive High Schools among the U.S.A., Japan and Taiwan
3 pm - 3.30 pm	*Lee, Lung-Sheng,* Professor, Department Chair, Department of Industrial Technology Education, National Taiwan Normal University, Taiwan, Republic of China
Topic 2:	An Overview of Vocational Education in Botswana, Swaziland and Zimbabwe
3.30 pm - 4 pm	*Loots, Philip,* Principal, East London Technical College, South Africa
	Chair: *Kirveskari, Tuija,* Counsellor of Education, Finnish National Board of Education, Finland Facilitator:

Congress Halls A and B

Session E	**Networks between Vocational and General Education**
Topic 1:	The Process Model of Cooperation between Upper Secondary Schools and Vocational Institutions
3 pm - 3.30 pm	*Numminen, Ulla,* Counsellor of Education, National Board of Education, Finland
Topic 2:	Identification and Utilization of Education Trends for Cooperative Education Enhancement
3.30 pm - 4 pm	*Leventhal, Jerome,* Professor, Department of Vocational Education, Temple University, PA, USA
	Chair: *Coughenour, Amy,* Project Coordinator, Center for Occupational Research and Development, Tex, USA Facilitator: *Havio, Marja-Liisa,* International Coordinator, Helsinki City College of Health Care, Finland

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Congress Halls A and B

4 pm - 5 pm	Closing Ceremonies
7 pm -	Evening Program: "Nightless Night" -Open-ended Conference Banquet and Ball at Kulosaari Casino

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Thursday, August 28

8 am - 9 am	IVETA Executive Committee Meeting Breakfast Hall, Intercontinental Hotel
	College Visits

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